TigerSwitch 100
User Guide

From SMC's Tiger line of feature-rich workgroup LAN solutions

SMC®

March 1998
900.168 Rev. B

TigerSwitch 100

8-port Fast Ethernet Switches

- Two models featuring either:
  - Eight fixed Auto-Negotiating 100BASE-TX ports
  - Two 4-port replaceable modules with 100BASE-TX and/or 100BASE-FX ports
- 1.6 Gbps internal bandwidth
- In-band and out-of-band management

SMC®

User Guide

SMC6608T *SMC6608M*

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COMPLIANCES

FCC - Class A

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

You may use unshielded twisted-pair (UTP) cable for RJ-45 connections—Category 3 or greater for 10 Mbps connections and Category 5 for 100 Mbps connections. Use 50/125 or 62.5/125 multimode fiber optic cable for SC or ST-type connections.

Warnings

1. Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.
2. When connecting this hub to a power outlet, connect the field ground lead on the tri-pole power plug to a valid earth ground line to prevent electrical hazards.

EC Conformance Declaration

SMC contact for these products in Europe is:

SMC (Europe) Limited
1st Floor, Pyramid House, Easthampstead Road
Bracknell, Berkshire RG12 1NS, United Kingdom

This information technology equipment complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. It conforms to the following specifications:

EMC:	EN55022 (1988)/CISPR-22 (1995)	Class A
	IEC 1000-4-2	4 kV CD, 8 kV AD
	IEC 1000-4-3 (1995)	3 V/m
	IEC 1000-4-4 (1995)	1.0 kV - (power line) 0.5 kV - (signal line)
	IEC 1000-4-6 (1995)	3 Vrms

An EC Declaration of Conformity in accordance with ISO/IEC Guide 22 and EN45014 was issued for this product.

Industry Canada - Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur : "Appareils Numériques", NMB-003 édictée par l'Industrie.

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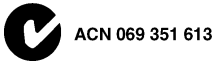

SMC Communications Pty. Ltd.
LVL 10, 201 Miller Street, North Sydney, NSW 2060
Phone: 61-2-9929-9150
Fax: 61-2-9929-9140

Safety Compliance

Underwriters Laboratories Compliance Statement

Important! Before making connections, make sure you have the correct Cord set. Check it (read the label on the cable) against the following:

Operating Voltage	Cord Set Specifications
120 Volts	UL Listed/CSA Certified Cord Set
	Minimum 18 AWG
	Type SVT or SJT three conductor cord
	Maximum Length of 15 feet
	Parallel blade, grounding type attachment-plug rate 15 A, 125 V
240 Volts (Europe Only)	Cord Set with H05VV-F cord having three conductors with minimum diameter of 0.75 mm^2
	IEC-320 receptacle
	Male plug rated 6 A, 250 V

The unit automatically matches the connected input voltage. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the rear panel.

Wichtige Sicherheitshinweise

1. Bitte lesen Sie diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssigoder Aerosolreiniger. Am besten eignet sich ein angefeuchtetes Tuch zur Reinigung.
4. Die Netzanschluß steckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Beschädigungen hervorrufen.
7. Die Belüftungsöffnungen dienen der Luftzirkulation, die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen, die sich am Gerät befinden, sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.

13. Öffnen sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

    a. Netzkabel oder Netzstecker sind beschädigt.

    b. Flüssigkeit ist in das Gerät eingedrungen.

    c. Das Gerät war Feuchtigkeit ausgesetzt.

    d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

    e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

    f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger.

CHAPTER 1
ABOUT THE TIGERSWITCH 100

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TigerSwitch 100 Overview

SMC's TigerSwitch™ 100 units are intelligent Fast Ethernet switches. There are two TigerSwitch 100 models available. The first, the TigerSwitch 100T *(SMC6608T)*, features 8 fixed 10BASE-T/100BASE-TX ports. The predominance of dual-speed, Auto-Negotiating ports on the SMC6608T make this unit ideally suited for Fast Ethernet migration.

The ports on the other TigerSwitch 100 model, the TigerSwitch 100M *(SMC6608M)*, are distributed among two slide-in, removable modules. The modules are sold separately from the base unit and feature various combinations of 10BASE-T/ 100BASE-TX and 100BASE-FX ports. This modular design allows for numerous variations in port configuration, making this switch highly versatile and adaptable to any number of different network applications.

The TigerSwitch 100 models employ a high-speed, non-blocking switching fabric. This design allows for simultaneous wire-speed transport of multiple packets at low latency on all ports. They also feature full-duplex capability on all ports, which effectively doubles the bandwidth of each connection.

These switches also provide for effective system management. In addition to "at a glance" LEDs, the TigerSwitch 100 models are equipped with system configuration software that can be accessed out-of-band via an RS-232 console port or in-band via Telnet. Also included is an on-board SNMP agent, which can be used to manage the switch with SMC's EliteView™ or any other SNMP-based management application.

The TigerSwitch 100 units support an optional Redundant Power Unit to minimize downtime in the event of an AC power failure.

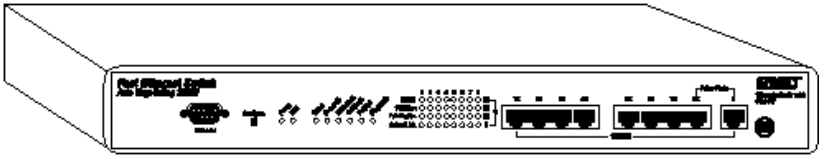


Figure 1-1. TigerSwitch 100T with 8 10BASE-T/100BASE-TX Ports (Model SMC6608T)

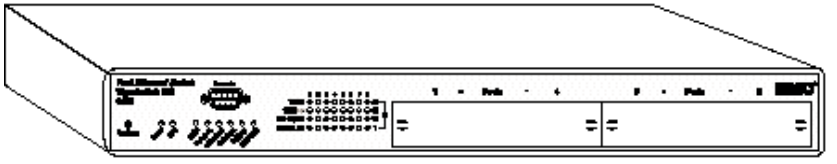


Figure 1-2. TigerSwitch 100M Base Unit (Model SMC6608M)

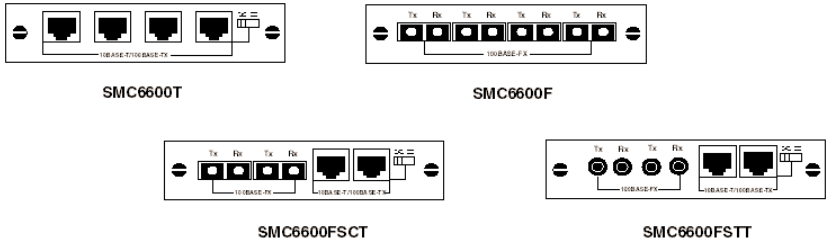


Figure 1-3. 4-port Fast Ethernet Modules

4-Port Fast Ethernet Modules for Model SMC6608M

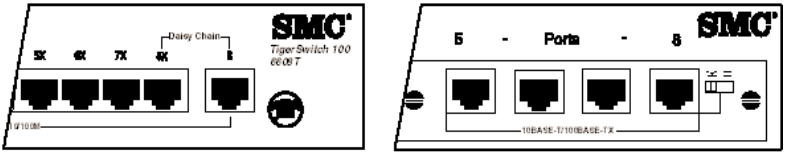
The avalable slide-in modules are listed below:

Module	Ports	Connectors	Description
SMC6600T	1-3	RJ-45	100BASE-TX, fixed crossover
	4	RJ-45	100BASE-TX, switch-selectable crossover
SMC6600F	1-4	SC	100BASE-FX, fiber
SMC6600FSCT	1-2	SC	100BASE-FX, fiber
	3	RJ-45	100BASE-TX, fixed crossover
	4	RJ-45	100BASE-TX, switch-selectable crossover
SMC6600FSTT	1-2	ST	100BASE-FX fiber
	3	RJ-45	100BASE-TX, fixed crossover
	4	RJ-45	100BASE-TX, switch-selectable crossover

Switch Ports

10BASE-T/100BASE-TX Ports

These ports are dual-speed RJ-45 ports with built-in wiring crossovers. Each TigerSwitch 100 equipped with 10BASE-T/100BASE-TX ports will contain at least one straight-through (daisy-chain) port. This port is used for straight-through cable connections to other devices (i.e., hubs or switches) which have ports with built-in crossovers.



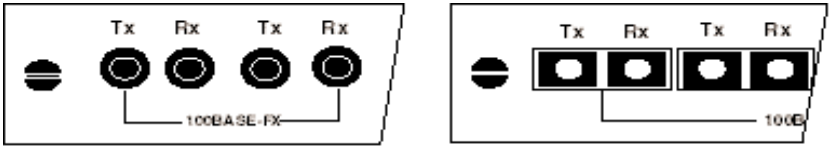
SMC6608T SMC6608M

Figure 1-4. 10BASE-T/100BASE-TX Ports

Each 10BASE-T/100BASE-TX port supports Auto-Negotiation, so the optimum transmission mode (half or full duplex) and data rate (10 Mbps or 100 Mbps) are selected automatically. If a device connected to one of these ports *does not* support Auto-Negotiation, the communication mode of that port can be configured manually.

100BASE-FX Ports (SMC6608M only)

The 100BASE-FX ports are fitted with SC or ST connectors (depending on the module) and operate exclusively at 100 Mbps. However, the transmission mode for these ports is adjustable to full- or half-duplex and must be set manually.



ST connectors SC connectors

Figure 1-5. 100BASE-FX Ports

Status LEDs

The LEDs on the TigerSwitch 100 models are located on the front panel for easy viewing. For a more complete discussion of the front-panel LEDs, see Chapter 4, "Configuration and Management."

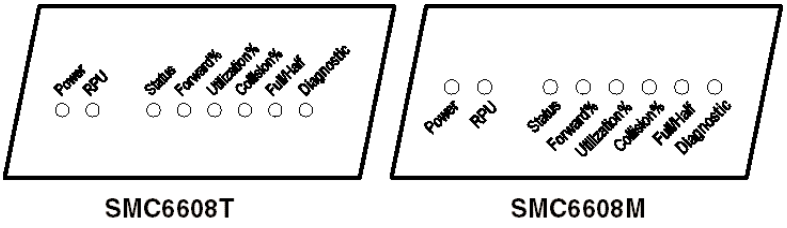


Figure 1-6. Front Panel LEDs

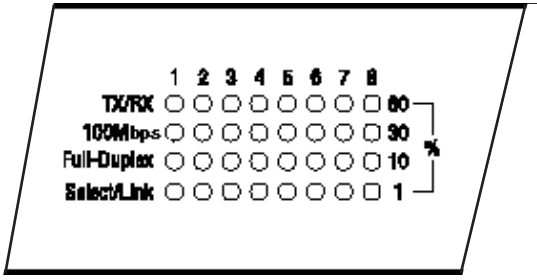


Figure 1-7. Front Panel LED Array

Console Port

Both TigerSwitch 100 units contain a Console port on the front panel. This is an RS-232 serial port with a DB-9 connector. A PC may be connected to this port for configuration and monitoring purposes out-of band via a full-handshaking null modem cable. (See Appendix B)

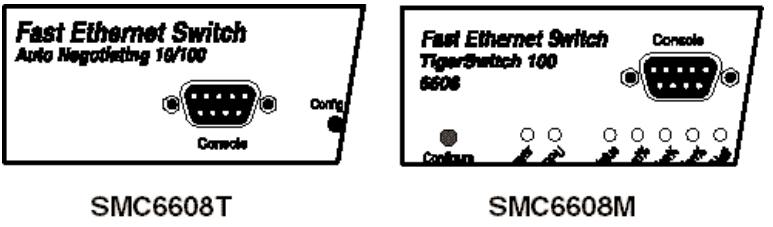


Figure 1-8. Console Port

Configure Button

The Configure button is located on the left-front panel of the TigerSwitch 100 and is used in conjunction with the LEDs to display a wide range of performance and status data for every port. The Configure button can also be used to manually set port communication modes and initiate diagnostic tests.

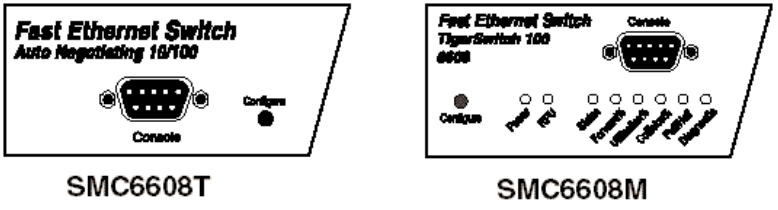


Figure 1-9. Configure Button

Optional Redundant Power Unit

SMC's Redundant Power Units (RPUs) are separate devices and each has its own power cord. These devices can supply power to the unit in the event of a failure of the internal power supply. The available RPUs are listed in the table below. Contact your reseller for advice regarding the appropriate RPU for your specific application.

Redundant Power Units (RPUs)	
Order Number	**Description**
SMC-RPUX1	Supports one SMC device
SMC-RPUX5	Supports up to 5 SMC devices

Power Supply Receptacles

There are two power receptacles on the rear-panel of each TigerSwitch 100. The standard receptacle labeled "Power" is for the AC power cord. The 14-pin receptacle labeled "DC Input" is for the optional Redundant Power Unit (RPU).

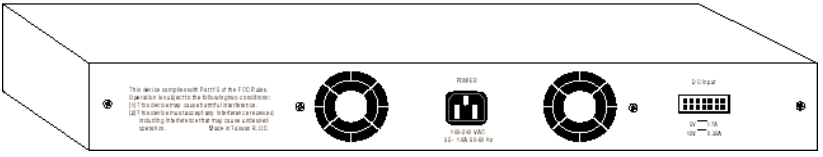


Figure 1-10. Power Supply Receptacles

Switch Architecture

Switching Methods

Adaptive Cut-Through

SMC's TigerSwitch 100 models employ a dynamic forwarding architecture that enables them to support adaptive cut-through frame forwarding mode. This approach allows the switch to automatically alternate between three different switching methods to provide the best possible performance in response to current network conditions.

Cut-Through

Also known as "on-the-fly" switching, the cut-through switching technique involves forwarding each data packet as soon as the 6 byte destination address in the header has been read. It does not wait until the entire packet has been received. This method, which takes up the least processing time, reduces the latency of each packet to twenty microseconds (20 µsec) or less. Cut-through switching mode is the default setting of each port on the TigerSwitch 100.

Fragment-Free

This switching method is similar to cut-through, but it requires that the first *64* bytes of the data packet be received before it is forwarded. This enables the switch to discard *runt packets* - smaller than legal size packets which are collision byproducts - and effectively clean up the data stream. This method provides the greatest benefit when the collision rate is high (e.g., when the switch is used to interconnect several shared segments, each having a large number of end stations.)

Store-and-Forward

In store-and-forward switching mode, the entire packet must be received into a buffer and checked for validity before being forwarded. This prevents errors from being propagated throughout the network.

Spanning Tree Protocol

The TigerSwitch 100 switches support the ANSI/IEEE 802.1d Spanning Tree Protocol. This protocol adds a level of fault tolerance by allowing two or more redundant connections to be created between a pair of LAN segments. When there are multiple physical paths between segments, the protocol will choose a single path and disable all others to ensure that only one route exists between any two stations on the network. This prevents the creation of network loops. However, if the chosen path should fail for any reason, an alternate path will be activated to maintain the connection.

The default setting for Spanning Tree Protocol is "enabled". This protocol may be configured (enabled or disabled) out-of-band via the serial console port or in-band via the SNMP agent or Telnet.

Management Options

The TigerSwitch 100 units may be managed using any one of the following three methods:

- Out-of-band via the RS-232 console port
- In-band via Telnet
- In-band via any SNMP-based network management program that includes a compiler

Serial Console Port

The switches may be managed out-of-band using a PC connected to the console port with an RS-232 full-handshaking null modem cable. The console port operates at 9600 baud (default value) or 19,200 baud and can be password-protected. A terminal application for use on the PC, such as Windows Terminal, is also required. *See Chapter 4, "Configuration and Management," for further information regarding out-of-band management.*

Telnet

The switches can also be managed in-band via a Telnet connection using TCP/IP protocol. The Telnet user interface is menu-driven and the switch's operating parameters can be password-protected. *See Chapter 4, "Configuration and Management," for further information regarding in-band management.*

SNMP

Another method by which these switches may be managed is in-band from a workstation via an SNMP-based manager (i.e., SMC's EliteView). Simple Network Management Protocol (SNMP) is the most popular management protocol in use today. It defines the structure of information maintained on a device being managed and the operations used to access that information. *See Chapter 5, "SNMP Management," for further information regarding in-band SNMP.*

Key Features and Benefits

Connectivity

- Slide-in, replaceable 4-port modules for added flexibility *(Model SMC6608M only)*
- 100BASE-FX ports with SC or ST connectors *(Model SMC6608M only)*
- Auto-Negotiation on 10BASE-T/100BASE-TX ports automatically selects optimum communication mode (half or full duplex and 10 Mbps or 100 Mbps) if this feature is supported by the attached device; otherwise port can be configured manually
- IEEE 802.3 Ethernet and 802.3u Fast Ethernet compliance ensures compatibility with standards-based hubs, cards and switches from any vendor
- Independent RJ-45 10BASE-T/100BASE-TX ports with built-in wiring crossovers for straight-through cable connections
- 10BASE-T/100BASE-TX daisy-chain port(s) for network device connections with straight-through cable
- Half- or full-duplex operation on each port
- Unshielded (UTP) cable supported on all RJ-45 ports: Category 3, 4 or 5 for 10 Mbps connections and Category 5 for 100 Mbps connections
- One RS-232 serial console port for local or remote out-of-band management

Performance

- Aggregate bandwidth of 1.6 Gbps
- Minimum latency of packet transmission less than 20 microseconds (cut-through switching mode)
- Transparent bridging function supported

- Operates at maximum packet filtering and forwarding rate
- Supports cut-through, store-and-forward, fragment-free and adaptive cut-through packet transport techniques
- Routing table with over 4 K MAC address entries for attached network nodes
- Automatically learns MAC addresses to build the routing information database
- Fast hashing scheme quickly retrieves information from routing table
- Filters and forwards packets at line-rate speed on all ports
- Non-blocking cross-bar switching matrix allows concurrent operation of up to 8 LAN segments
- Back pressure Flow Control eliminates frame loss
- Automatically filters local traffic
- Transparent to all higher level protocols

Practical Management

- "At-a-Glance" LEDs for monitoring all segments
- Configure button simplifies basic configuration and monitoring
- Console Interface for more advanced configuration and port control

Easy Installation

- Desktop and rack-mountable (standard 19-inch rack)
- Self-diagnostics
- Automatic polarity detection and correction

CHAPTER 2

PLANNING

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Introduction to Switching

An Ethernet or Fast Ethernet switch allows simultaneous transmission of multiple packets via high-bandwidth shared memory. This means that it can partition a network more efficiently than bridges or routers. The switch is, therefore, fast being recognized as one of the most important building blocks for today's networking technology.

When performance bottlenecks are caused by congestion at the network access point (such as the network card for a high-volume file server), the device (server, power user or switch) can be attached directly to a switched port. And, by using full-duplex mode, the bandwidth of the dedicated segment can be doubled to maximize throughput.*

When networks are based on repeater (hub) technology, the maximum distance between end stations is limited. For Ethernet, there may be up to four hubs between any pair of stations; for Fast Ethernet, the maximum is two. This is known as the hop count. However, a switch turns the hop count back to zero, so subdividing the network into smaller and more manageable segments, and linking them to the larger network by means of a switch, removes this limitation.

A switch can be easily configured in any Ethernet or Fast Ethernet network to significantly boost bandwidth while using conventional cabling and network cards.

***Note:** When connected to a shared collision domain (such as a hub with multiple workstations), each switched port may operate only in half-duplex mode.

Sample Applications

The TigerSwitch 100 is not only designed to segment your network, but also to provide a wide range of options in setting up network connections. Some typical applications for the TigerSwitch 100 are described below.

Collapsed Backbone

The TigerSwitch 100 is an excellent choice for Ethernet installations where significant growth is expected in the near future. You can easily build on this basic configuration, adding direct full-duplex connections to workstations or servers. When the time comes for further expansion, just cascade the TigerSwitch 100 to an Ethernet or Fast Ethernet hub or switch.

In the figure below, the TigerSwitch 100T (Model SMC6608T) is operating as a collapsed backbone for a small LAN. It provides dedicated 10 Mbps and 100 Mbps half-duplex connections to workstations and 200 Mbps full-duplex connections to power users and servers.

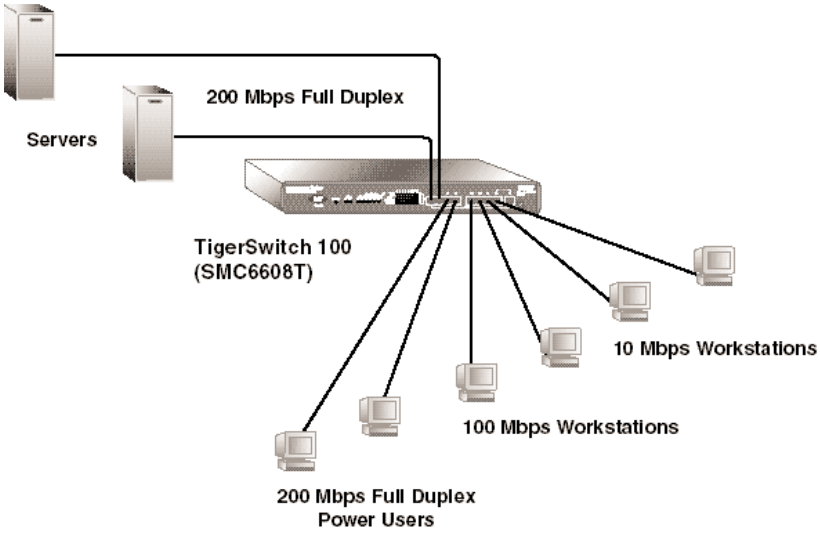

Figure 2-1. Collapsed Backbone

Multiport Bridging

With 8 parallel bridging ports (i.e., 8 distinct collision domains), the TigerSwitch 100 can collapse a complex network down into a single efficient bridged node, increasing overall bandwidth and throughput.

In the figure below, the 10BASE-T/100BASE-TX ports on the TigerSwitch 100T (Model SMC6608T) are providing 100 Mbps connectivity for up to 16 segments through SMC's TigerStack™ 100 hubs. In addition, the switch is also connecting servers at 200 Mbps.

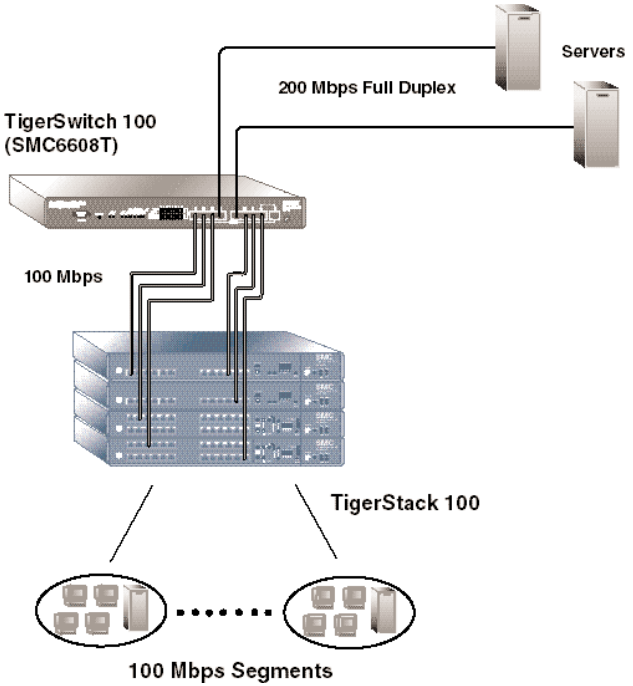

Figure 2-2. Multiple Port Bridging Connections

Server Farm Aggregation

The advantages of mixed-media can also be easily exploited with the TigerSwitch 100M because of the various port configurations available among its 4-port modules.

In the following example, a TigerSwitch 100M, equipped with modules featuring 10BASE-T/100BASE-TX and 100BASE-FX ports, is providing localized Fast Ethernet connectivity between an expanding server farm and associated LANs.

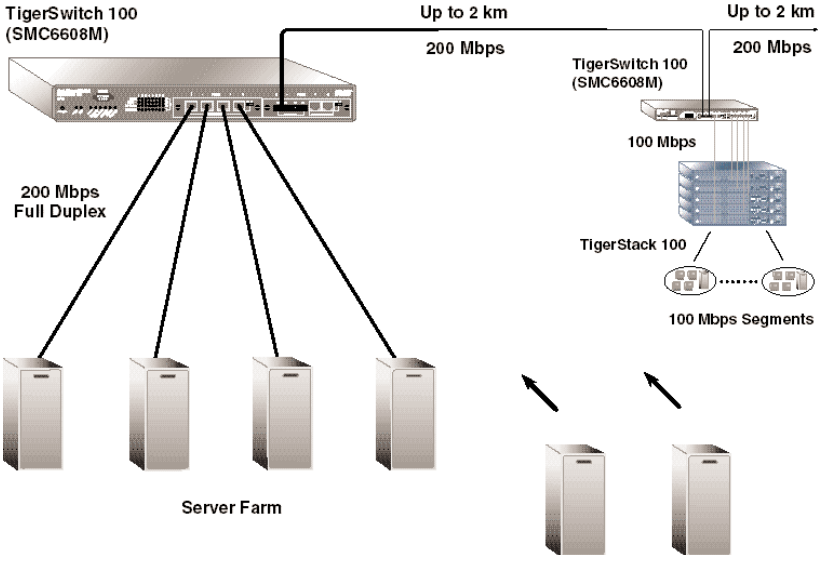

Figure 2-3. Server Farm Connectivity and Expansion

High-Speed Switch Links

Most common LAN implementations use a combination of hubs, bridges and routers. The bridges and routers quickly become bottlenecks, reducing overall network throughput. Using switches instead of bridges and routers allows you to tie together LAN segments and retain a cohesive LAN structure in which any node can freely communicate with any other node in the network.

In the following figure, the TigerSwitch 100M (Model SMC6608M) is cascaded via the 10BASE-T/100BASE-TX daisy-chain port to an 8-port Fast Ethernet switch, SMC's EZ Switch™ 100, forming a high-speed 200 Mbps, full-duplex backbone. The other 10BASE-T/100BASE-TX ports are connected to power users, and the 100BASE-FX ports are connected to servers.

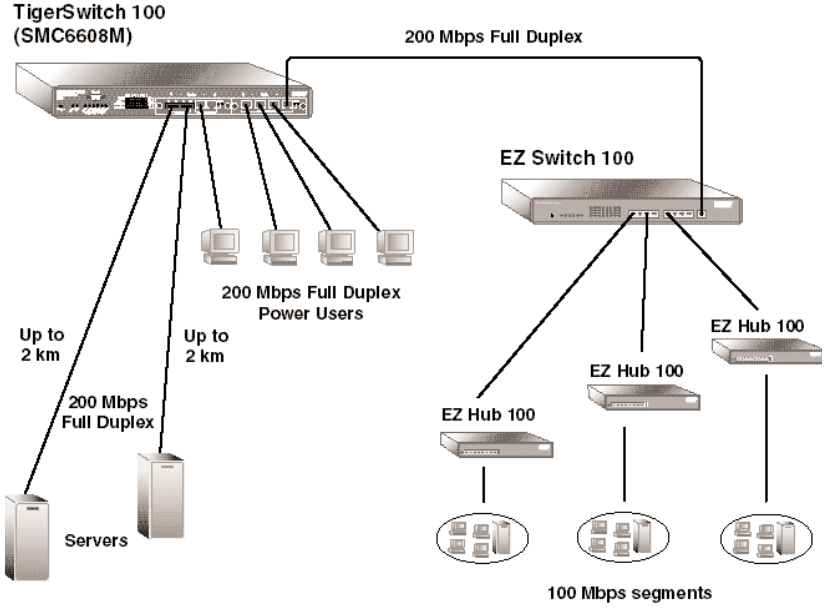

Figure 2-4. Cascading to a Fast Ethernet Switch

Collapsed Backbone with Fiber Cable

Fiber optic technology allows for a longer cable run distance (up to 2 km in full-duplex) than any other media type. The TigerSwitch 100M, used as a collapsed backbone to interconnect multiple Fast Ethernet segments with fiber cable, is a convenient way to provide direct connectivity for a wide-spread LAN.

The figure below illustrates a TigerSwitch 100M connecting multiple segments with up to 2 km of fiber cable.

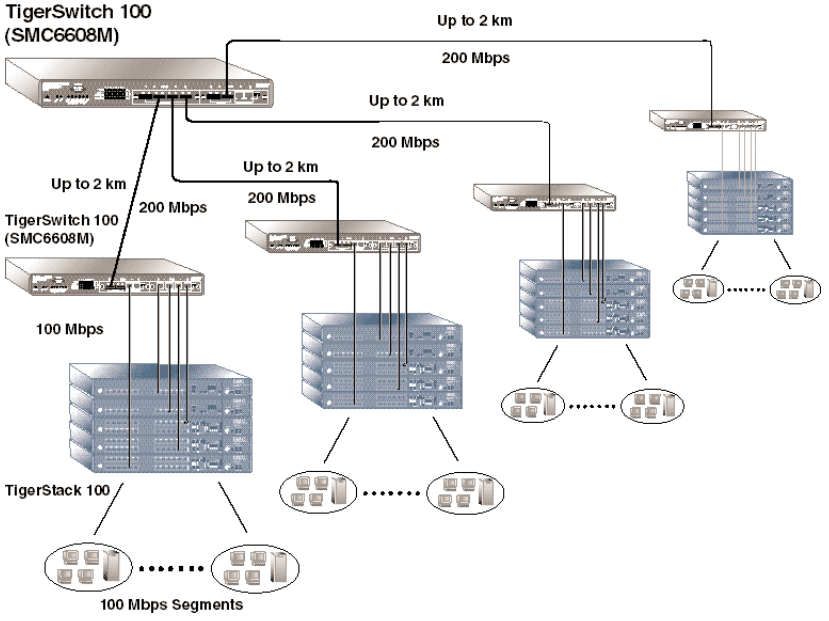

Figure 2-5. Collapsed Backbone Using Fiber Cable

High-Speed Fiber Backbone

When maximum network reach is required, the TigerSwitch 100M (Model SMC6608M) can be used to help create a high-speed fiber backbone.

In the figure below, a TigerSwitch 100M employed as a collapsed backbone is also part of a full-duplex, 200 Mbps fiber backbone.

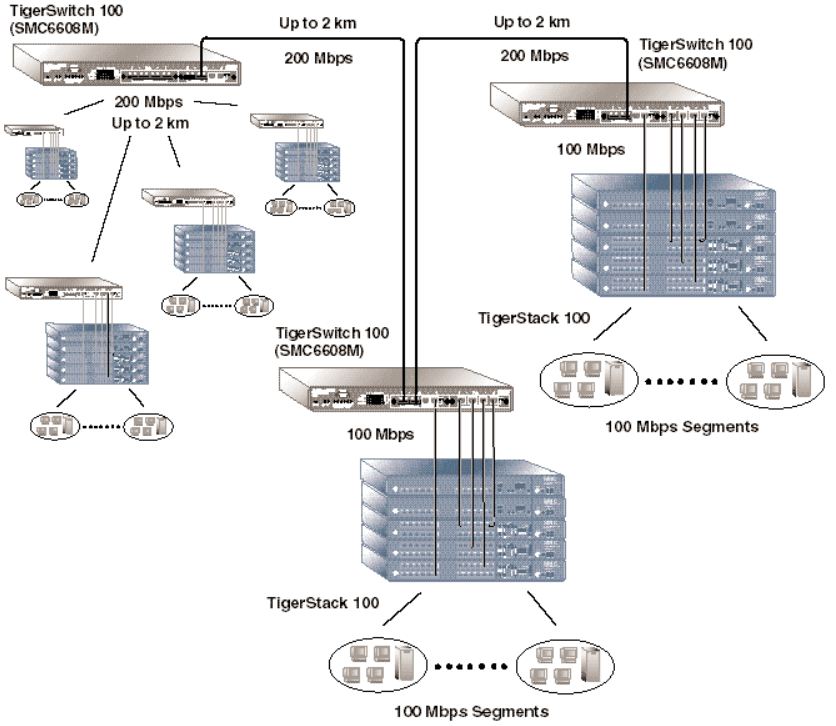

Figure 2-6. High-Speed Fiber Backbone

Application Notes

1. Full-duplex operation only applies to point-to-point access (e.g., when the switch is attached to a workstation, server or another switch). When the switch is connected to a hub, both devices must operate in half-duplex mode.
2. For network applications that actually require routers (e.g., interconnecting dissimilar network types), attaching switches directly to a router can significantly improve overall network performance.

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INSTALLATION

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Selecting a Site

Before you start actual hardware installation, make sure you can provide the right operating environment, including power requirements, sufficient physical space and proximity to other network devices. Verify the following installation requirements:

- The site should:
  - be located in a cool, dry place, with at least 4 in. (10 cm) of space at the front and back for ventilation
  - be located out of direct sunlight and away from heat sources or areas with a high amount of electromagnetic interference
  - allow the status LEDs to be clearly visible
- Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference (i.e., radios, transmitters, etc.).
- Make sure that a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, is within 8 feet (2.44 m) of the unit. The switch's power supply automatically detects the input voltage level. And, as with any electronic equipment, using a filter or surge suppressor is recommended.

Equipment Checklist

Package Contents

In addition to this user guide, the package should contain:

- one (1) TigerSwitch 100 switch
  - **Model SMC6608T** (8 10BASE-T/100BASE-TX ports)

  or

  - **Model SMC6608M** (2 4-port module slots with protective covering plates)*
- two (2) brackets with screws for rack mounting the unit
- four (4) rubber foot pads
- appropriate power cord(s)
- SMC Warranty Registration Card — be sure to complete and return this card within 90 days

Required Rack-Mounting Equipment

Be sure to have the following equipment available when mounting your switch in a rack:

- Four rack-mounting screws
- A screwdriver (Phillips-head or flathead, depending on the type of screws used)

***Note:** Be sure to install the module(s) you are planning to use in this unit *before* you proceed with mounting the switch and applying power. Please refer to the installation guide included with each module for specific installation instructions.

Mounting

The TigerSwitch 100 is suitable for desktop or rack-mount installation. A good location is at the center of all the devices you want to link and near a power outlet.

This switch can also be stacked with other switches on a flat surface or in a rack. Refer to the following sections: "Mounting the Switch in a Rack" and "Mounting and Stacking the Switch on a Flat Surface" for a description of these methods.

Mounting the Switch in a Rack

Before rack mounting the switch, pay particular attention to the following factors:

- **Temperature:** Since the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (See Appendix C)
- **Mechanical Loading:** Do not place any equipment on top of a rack-mounted unit.
- **Circuit Overloading:** Be sure that the supply circuit to the rack assembly is not overloaded.
- **Grounding:** Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to AC power mains.

To rack mount the switch:

1. Attach the brackets to the device using the screws provided.

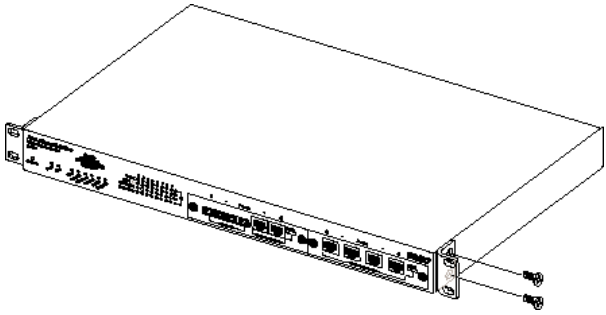


Figure 3-1. Attaching the Brackets

2. Mount the device in the rack, using four rack-mounting screws.

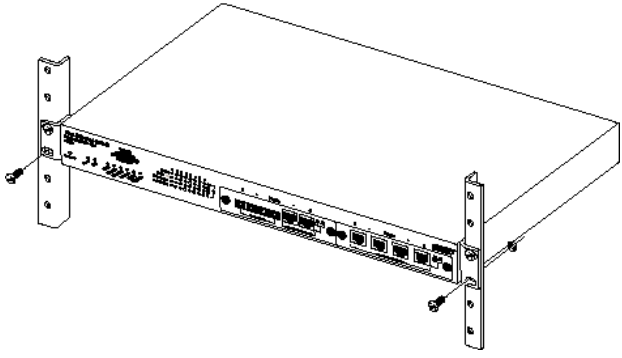


Figure 3-2. Installing the Switch in a Rack

Mounting and Stacking the Switch on a Flat Surface

1. Attach the four adhesive feet to the hollow spaces on the bottom of the switch.

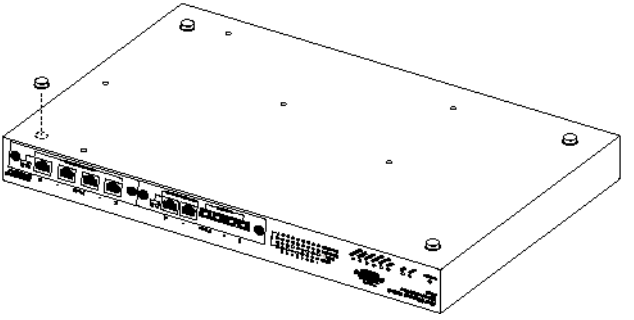


Figure 3-3. Attaching the Adhesive Feet

2. Set the switch on a flat surface near an AC power source, making sure there are at least 4 inches (10 cm) of space in the front and back for proper air flow.

3. To stack switches, repeat Step 1 for every subsequent switch and then gently place each new switch on top of the previous switch.

Powering Up

Connecting to a Power Source

1. Power on the switch by plugging one end of the power cord into the power socket on the rear panel, and the other end into a power outlet. *(See Chapter 2 for a description of the rear-panel power receptacles)*

   North America: Each switch is shipped with one standard AC line cord for North America (UL and CSA approved).

   International: The international version of each switch is shipped with AC line cords for Continental Europe and the UK. If you need to change the line cord, you must use a line cord set that has been approved for the receptacle type in your country. Any cord used must be HAR certified, and must have "HAR" stamped on the outside of the cord jacket to comply with the CENELEC Harmonized Document HD-21. the female receptacle must meet CEE-22 requirements and IEC 320-030 specifications.

   The switch automatically selects the setting that matches the connected input voltage. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the rear panel of the unit.

Caution: *The 4-port modules for the TigerSwitch 100M* ***are not hot-swappable****. If you plan to replace one of the modules,* ***you must disconnect the power*** *to prevent damaging the switch and/or the module.*

2. If you have purchased a Redundant Power Unit (RPU), plug the 14-pin connector from the RPU into the mating connector on the rear panel of the switch (See the guide supplied with the RPU).

3. Check to insure that the front-panel Power LED is lit. If not, check that the power cable is correctly plugged in. *(Refer to Chapters 1 and 4 for detailed explanations of the LEDs.)*

Diagnostics

Upon power up, the system performs an internal self-diagnostic test of major switch components. If any component fails during the test, the switch will try to complete the diagnostic procedure. Otherwise, the system will hang.* The components tested include:

- System ROM
- System EEPROM
- Ports

*** Note:** If the system should hang, take note of the LED indicators and contact SMC Technical Support.

Making Network Connections

Switches are designed to interconnect multiple segments, or collision domains. Each segment may contain a single server or workstation, or multiple workstations that are connected to a hub.

Connectivity Rules

An overview of the rules for both Ethernet and Fast Ethernet collision domains is provided below.

10 Mbps Ethernet Collision Domain

SMC 5 - 4 - 3 Rule

Between any two PCs or other stations in the same 10 Mbps collision domain, there may be:

- up to 5 cable segments in series,
- up to 4 repeaters (hubs),
- up to 3 populated cable segments, that is, segments attached to two or more PCs (coax networks only).*

* The remaining two segments are unpopulated; these are known as inter-repeater links or IRLs. This distinction between populated and unpopulated segments is significant for coax networks only.

Maximum Cable Length

Cable Type	Maximum Length
Twisted Pair, Categories 3, 4, 5	100 m (328 ft.)

100 Mbps Fast Ethernet Collision Domain

SMC 3 - 2 Rule for Class Ⅱ Repeaters

Between any two PCs or other stations in the same 100BASE-T collision domain, there may be:

- up to 3 link segments and
- up to 2 Class Ⅱ repeaters (hubs)

SMC 2 - 1 Rule for Class Ⅰ and Class Ⅱ Repeaters

Between any two PCs or other stations in the same 100BASE-T collision domain, there may be:

- up to 2 link segments and
- only 1 Class Ⅰ or Class Ⅱ repeater (hub)

Maximum 100BASE-T Network Diameter

Repeater Type and Number	Twisted Pair	Twisted Pair/Fiber	
	100BASE-TX/T4	100BASE-T4/FX	100BASE-TX/FX
1 Class Ⅰ	200 m (656 ft.)	231 m (757.7 ft.)	260.8 m (855.4ft.)
1 Class Ⅱ	200 m (656 ft.)	304 m (997.1 ft.)	308.8 m (1012.9 ft.)
2 Class Ⅱ	205 m (672.4 ft.)	236.3 m (775.1 ft.)	216.2 m (709.1 ft.)

Maximum 100BASE-T Cable Distance

Cable Type	Connecting	Max. Distance
Twisted Pair	Any two devices	100 m (328 ft.)
Fiber	Switch to Switch, Server or PC	
	Half duplex	412 m (1,351.4 ft.)
	Full duplex	2 km (1.24 mi.)
MII	Any two devices	0.5 m (1.6 ft.)

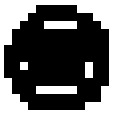
Twisted-Pair Cabling Guidelines

Each 10BASE-T or 100BASE-TX connection requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. For 10BASE-T connections, two pairs of 100 Ohm Category 3, 4 or 5 cable are required. 100BASE-TX connections require two pairs of certified Category 5 cable.

Every twisted-pair connection must have a wiring crossover to transmit and receive data. For convenience, this crossover is built into the 10BASE-T/100BASE-TX ports on the TigerSwitch 100 units*. Network cards *do not* have a built-in crossover, so PCs can be connected to crossover ports with straight-through cable. Hubs (and other switches) may have either crossover or straight-through ports. For this reason, the type of cable used to connect these devices to the TigerSwitch 100 is determined by the port on the other device, as shown in the table below.

Crossover/Straight-Through Wiring Requirements

If the TigerSwitch 100 port is...	And the port on the other device is	Then use...cable
Crossover (x)	Straight-through	Straight-through
Crossover (x)	Crossover (x)	Crossover
Straight-through	Straight-through	Crossover
Straight-through	Crossover (x)	Straight-through



Warning: Do not plug a phone jack connector into an RJ-45 port. This will damage the switch. Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

*** Note:** Each TigerSwitch 100 unit equipped with 10BASE-T/100BASE-TX ports will also have at least one daisy-chain port that does not have a built-in wiring crossover.

Connecting 10BASE-T/100BASE-TX Ports

Fixed Crossover Ports

Insert the RJ-45 connector on one end of a twisted-pair cable into an unused 10BASE-T/100BASE-TX port on the TigerSwitch 100, and the RJ-45 connector on the other end into a port on the other device.

1. Always use straight-through cable when connecting a server or workstation to the switch.
2. When connecting a hub, switch or other network device, the type of cable to be used (i.e., crossover or straight-through) depends upon the port on the device. (See "Twisted-Pair Cabling Guidelines" in this chapter.)
3. Make sure each twisted pair cable does not exceed 100 meters (328 ft.) in length. (See "Connectivity Rules" in this chapter.)
4. As each connection is made, the green Select/Link LED (in the LED array) corresponding to each port will light to indicate that the connection is valid.

Daisy-Chain Port

All TigerSwitch 100T units come with one daisy-chain (straight-through) port. It is an alternate for port 8. Every 4-port module for the TigerSwitch 100M with 10BASE-T/100BASE-TX ports contains a switch-selectable daisy-chain port (See Figure 3-4). Items **2**, **3** and **4** listed in the above section also apply to the daisy-chain port.

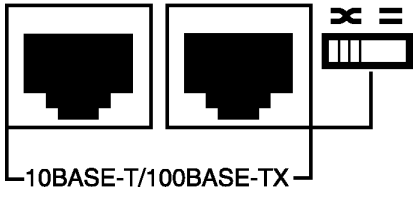


Figure 3-4. Switch-Selectable Daisy-Chain Port

Connecting 100BASE-FX Ports

TigerSwitch 100M fiber modules are equipped with either SC or ST connectors. Connect one end of a fiber optic cable to the appropriate fiber connector on the front panel of the TigerSwitch 100M, and the other end to the connector on the other device.

1. The100BASE-FX ports require 50/125 or 62.5/125 µ core multimode fiber optic cable with an SC or ST connector at each end.

2. Maximum fiber distance depends upon the transmission mode. In full-duplex mode, the maximum length of a fiber cable segment is 2 km (1.24 mi.); in half-duplex mode, it is 412 meters (0.25 mi). *(See the "Maximum 100BASE-T Cable Distance" chart on page 3-10.)*

3. The TigerSwitch 100 features Flow Control to prevent frame loss due to port saturation. If Flow Control is enabled for a 100BASE-FX port operating in half-duplex mode, the cabling distance from that port is limited to 180 m. *(See "Port Configuration" in Chapter 4 for further information regarding Flow Control.)*

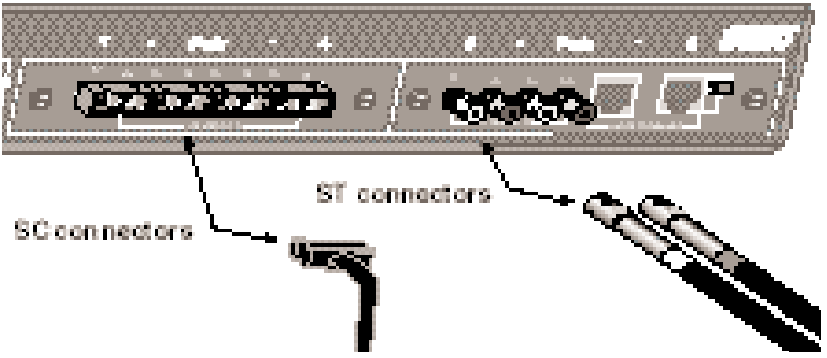


Figure 3-5. Fiber Cable Connectors

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CONFIGURATION AND MANAGEMENT

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Configuration Options

Basic port communication modes can be configured manually through the use of the front-panel Configure button. For more advanced management capability, the TigerSwitch 100 provides a menu-driven System Configuration Program which can be accessed through the Console Interface (out-of-band) or by a Telnet connection (in-band) over the network.

The TigerSwitch 100 also comes with an on-board management software module based on SNMP (Simple Network Management Protocol). This SNMP agent permits the switch to be managed from any PC in the network using optional in-band management software (i.e., SMC's EliteView).

The System Configuration Program **and** the SNMP agent support management functions such as:

- Enabling/Disabling of any port
- Communication Mode Configuration *(Full-, Half-duplex or Auto-Negotiation)*
- Switching Mode Configuration *(adaptive cut-through, cut-through, fragment-free or store-and-forward)*
- SNMP Parameter Configuration
- Virtual LAN (VLAN) Port Grouping Configuration
- Enabling/Disabling and Configuration of the Spanning Tree Algorithm
- System Restart

Basic Port Settings

When using the Configure button to set port communication modes:

1. Use a long press (>2 seconds) to begin function selection. The *Status* LED will start to flash to indicate that functions may be selected. Use short presses (<2 seconds) to cycle through the status LEDs until the *Full/Half* LED lights. Use a long press to initiate port communication mode selection. After the button is released, the *Full-Duplex* LED for Port 1 will begin to flash.

2. Use long presses to cycle through to the chosen port. The selection of the targeted port will be indicated by the lighting of the *Tx/Rx* LED for that port.

3. Use a short press to change the communication mode for the targeted port. The chosen mode will be indicated by the *Full-Duplex* LED for the port (Lit = Full*, Unlit = Half).

4. Use a long press to enable the selection.

5. Repeat Steps 2 through 4 for each chosen port.

The default communication mode setting for all ports is Auto-Negotiation, which dynamically selects either half- or full-duplex mode and 10 or 100 Mbps operating speed in response to the operating mode of the attached device. Auto-Negotiation can be re-established after a manual port configuration by removing the RJ-45 connector from the corresponding port on the switch and then reinserting it.

*__Note:__ Full-duplex mode can be used only for a dedicated link. When connecting to a shared collision domain (e.g., a hub), be sure the transmission mode is set for half-duplex mode.

Advanced System Configuration

Required Connections and Switch Access

Console Port (Out-of-Band) Connections

1. Plug the female end of a standard RS-232 null-modem cable into the switch connector labeled “Console”. Plug the other end of the cable into the serial connector on either a PC (typically COM1 or COM2) running a terminal emulation program or a VT100-compatible Terminal. See Appendix B for Console connector pin assignments.

2. If using a PC, power up the switch and set the terminal emulation type to VT100 and specify the PC port used (i.e., COM1, etc.). Then, set the communications to 8 data bits, 1 stop bit, no parity and 9600 or 19200 bps. The default baud rate is 9600 bps. Then, open the connection to the switch.

Remote Management via the Console Port

The Console port can also be used for switch management via a remote PC connected through a modem:

The TigerSwitch 100 Site

Connect the Console port to the modem’s serial port using standard cabling (e.g., not a null modem cable). Most modems have a 25-pin port. Therefore, you will have to provide an RS-232 cable with a 9-pin connector on one end (for the switch’s Console port) and a 25-pin connector on the other. The modem at the switch site does not have to be set because the switch will automatically configure it to auto-answer mode. (See Appendix B for 25-pin and 9-pin connector pinouts.)

The Remote PC site

At the remote PC site, connect the PC’s COM port (COM1, etc.) to the modem’s serial port. Make sure the modem’s baud rate is

9600 and the AT command set is supported. Set the terminal emulation type on the PC to VT100 and specify which PC COM port is being used. Then, set communications to 8 data bits, 1 stop bit, no parity and the baud rate to 9600 or 19200 bps. The default rate is 9600 bps. Then, dial into the switch. Use a terminal emulation package to connect over the modem.

In-Band Connections

Telnet

Telnet is a common terminal emulation application used in TCP/IP networks for remote terminal access to computer devices. Prior to accessing the switch in-band via Telnet or optional in-band management software, it must first be configured with a valid IP address, subnet mask and default gateway. This must be done via an out-of-band connection. Once the switch's IP parameters are configured, the menu-driven System Configuration Program may be accessed from anywhere in the network. Telnet into the switch using its assigned IP address.

SNMP Network Connection

You can access the TigerSwitch 100's on-board SNMP agent from any PC in the network that is running an SNMP-based manager (i.e., SMC's EliteView). However, prior to accessing the switch this way, it must first be configured with a valid IP address, subnet mask, default gateway and community string using an out-of-band connection.

The System Configuration Program

Login

The System Configuration Program software types and versions appear on this screen. The default passwords for the System Configuration Program are “admin” and “guest”. The admin password provides administrator rights (i.e., Read/Write access to configuration parameters and statistical information). The guest password provides only observer rights (i.e., Read-only access to statistical information and no access to Configuration or Software Download menus). Type “admin” and press <ENTER> to open the Main Menu.

The default passwords should be changed to prevent unauthorized access. (See “Setting Passwords” later in this chapter.)

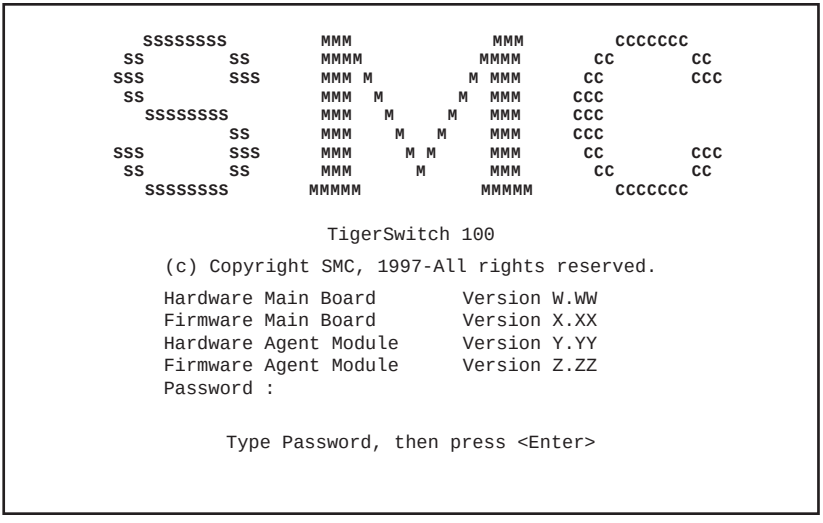

Figure 4-1. System Configuration Program Login Screen

Main Menu

The Main Menu provides access to all the sub-menus necessary to configure and monitor the switch.

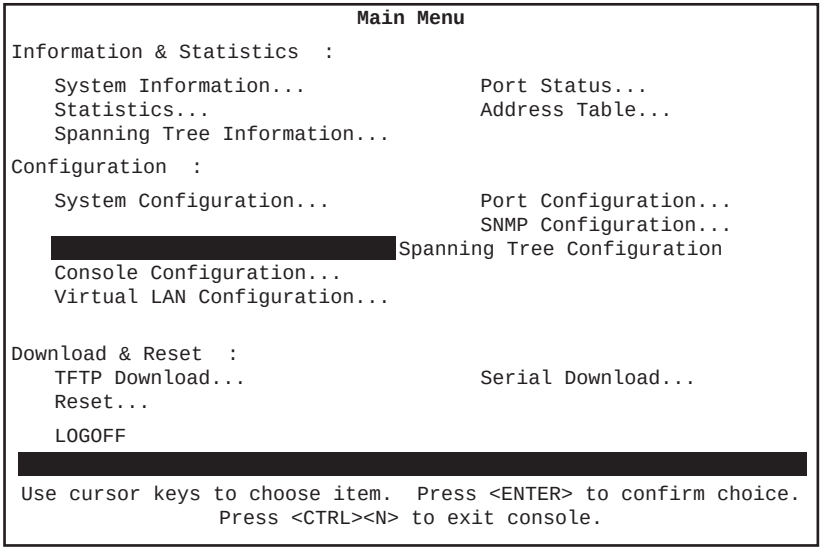

Figure 4-2. System Configuration Program Main Menu

Main Menu Items

Information and Statistics:

System Information: Provides detailed system description.
Statistics: Shows statistics for overall switch or each port.
Spanning Tree Information: Displays Spanning Tree Protocol parameter listing.
Port Status: Shows the operational state of each port.
Address Table: Shows the current addresses associated with each port.

Configuration:

System Configuration: Shows basic IP setup and identifies system by name, location and contact.
SNMP Configuration: Configures communities and trap managers.
Password Configuration: Sets Administrator and User passwords.
Virtual LAN Configuration: Assigns switch ports to form up to 8 independent LAN groups.
Port Configuration: Disables/enables any port; sets communication mode for any port; sets aging time for address table entries; sets switching mode: enables/disables flow control.
Spanning Tree Configuration: Enables/disables Spanning Tree Algorithm. Also sets Spanning Tree parameters, port priority and path cost.
Console Configuration: Sets communication parameters for console port.

Download & Reset:

TFTP Download: In-band download of updated firmware.
Serial Download: On-board download of updated firmware.
Reset: Resets hardware or configuration parameters, clears MAC address table.

LOGOFF: Exits program and discontinues communications.

Setting Passwords

1. Highlight "**Password Configuration**" in the Main Menu and press <ENTER>. This will access the Password Configuration Screen (See below).

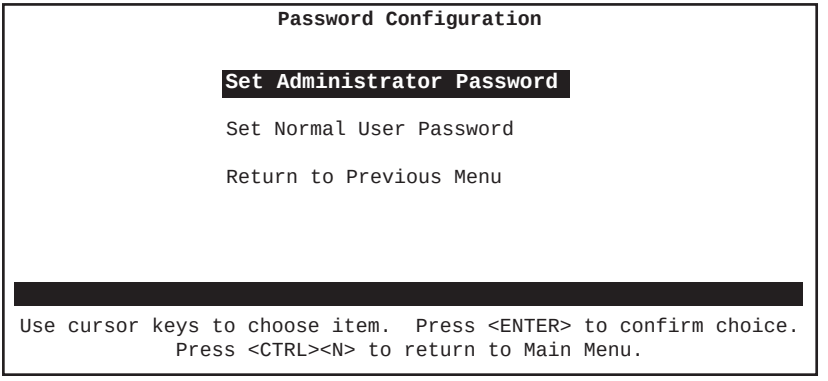

Figure 4-3. Password Configuration Screen

2. Highlight "**Set Administrator Password**" and press <ENTER> to password protect administrator rights (Read/Write privileges). Enter the default administrator password ("admin") in the space provided. The system will then request a new password and verification.

3. Choose set "**Normal User Password**" and press <ENTER> to assign a password for Read privileges only. The system will ask only for the new password.

After assigning passwords, you must exit the System Configuration program (LOGOFF on the Main Menu) for the changes to take effect. *If the user does not exit the program after setting new passwords, the interface **will not** be password protected.*

It is recommended that you assign an administrator password as soon as possible to prevent unauthorized switch re-configuration. If a password is set and then forgotten, contact SMC Tech support to regain system access.

Console Port Configuration

The communications parameters for the RS-232 port can be set using the System Configuration Program. Figure 4-3 (below) illustrates the factory default settings.

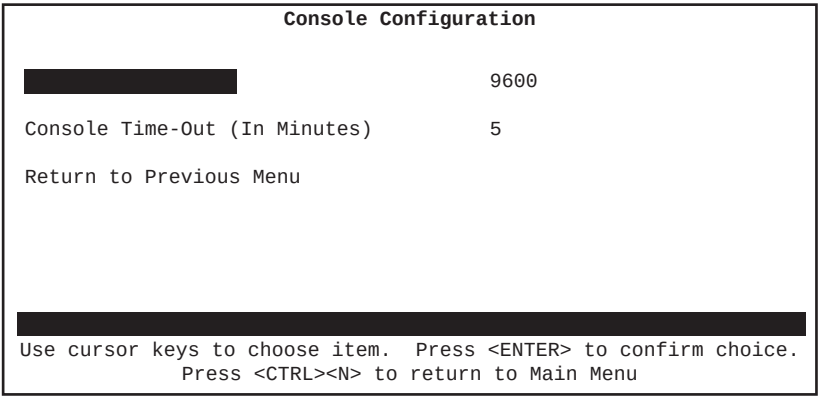

Figure 4-4. Console Configuration Screen

1. Highlight "**Console Configuration**" in the Main Menu and press <ENTER>. This will access the Console Configuration Screen.

2. Highlight "**Console Baud Rate**" to set the rate at which data is sent between the terminal or PC and the switch. Press <ENTER> and use the arrow keys to cycle through baud rates of 2400, 4800, 9600 and 19200. Choose either 9600 or 19200. Press <ENTER> again to confirm the chosen rate.

3. Highlight "**Console Time-Out (In Minutes)**" to set the time-out interval of the connection. Once this interval is exceeded, the connection "times-out" and returns the user to the Login screen. Press <ENTER> to input a value between 0* and 60 seconds. Press <ENTER> again to confirm the chosen interval.

***Note:** An entry of 0 in this field will disable the console time-out function.

System Parameter Configuration

1. Highlight "**System Configuration**" in the Main Menu and press <ENTER>. This will access the System Configuration Screen (See below).

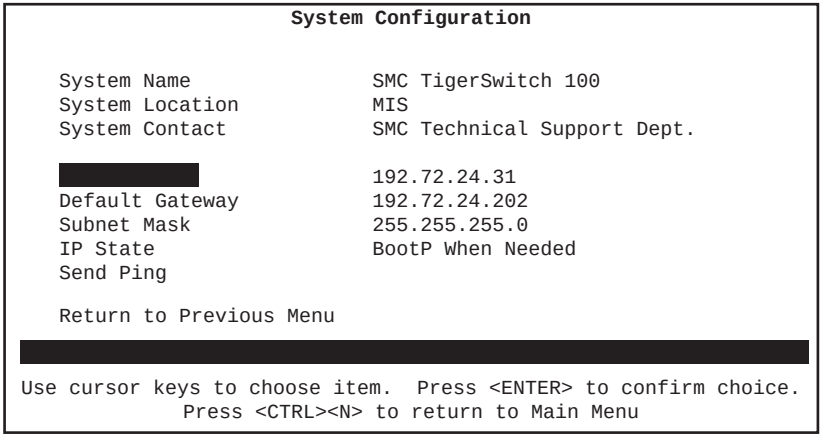

Figure 4-5. System Configuration Screen

2. Highlight "**System Name**" and press <ENTER> to assign a name to identify the switch if the default entry (see above) is not suitable. Press <ENTER> again to confirm entry.

3. Highlight "**System Location**" and press <ENTER> to input the physical location of the switch. Press <ENTER> again to confirm entry.

4. Highlight "**System Contact**" and press <ENTER> to specify the party to contact in the event of a switch malfunction. Press <ENTER> again to confirm entry.

5. Highlight "**IP Address**" and press <ENTER> to assign an IP address to the switch. Press <ENTER> again to confirm entry.

6. Highlight "**Default Gateway**" and press <ENTER> to set the default gateway IP address to which the unit will send IP packets destined for a different subnet. Press <ENTER> again to confirm entry.

7. Highlight "**Subnet Mask**" and press <ENTER> to set the subnet mask corresponding to the assigned IP address. Press <ENTER> again to confirm entry.

8. Highlight "**IP State**" and press <ENTER> to specify whether the switch's IP address is set by the Boot Protocol (BOOTP). The options are:
   - ♦ IP Disabled: Prevents the switch from processing any IP information it receives.
   - ♦ BOOTP When Needed: This is the default option. Will only try to set the IP address if the address stored in the EEPROM is 0.0.0.0
   - ♦ BOOTP Always: Will clear any non-zero IP address from the EEPROM to zero when the switch is booted.

9. Highlight "**Send Ping**" and press <ENTER> to issue an ICMP echo request to a specified IP address. Press <ENTER> again to send the echo request to the IP address specified. Used to verify validity of address (i.e., that a device can be reached).

Port Configuration

1. Highlight "**Port Configuration**" in the Main Menu and press <ENTER>. This will access the Port Configuration Screen illustrated below.

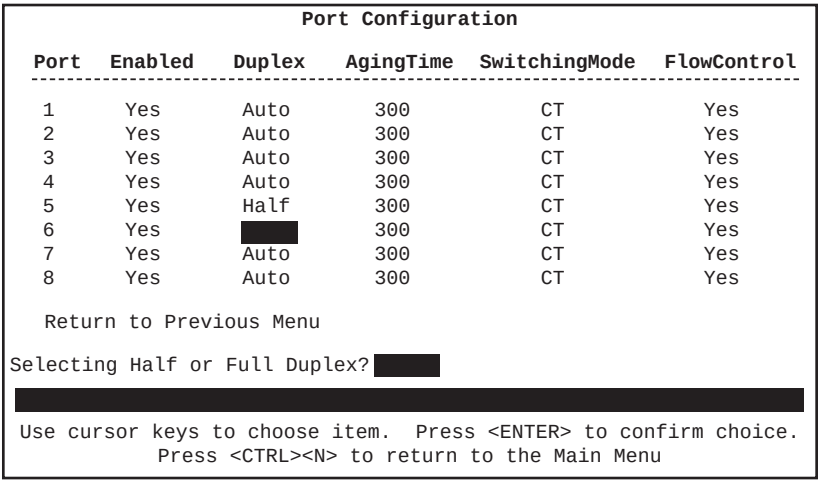

Figure 4-6. Port Configuration Screen

2. Highlight the setting under the "**Enabled**" column for the chosen port and press <ENTER> to use the arrow keys to toggle between enabling and disabling the port. Press <ENTER> again to confirm the choice.

3. Highlight the setting under the "**Duplex**" column to adjust the communication mode for the chosen port. Press <ENTER> to use the arrow keys to cycle through Full-duplex, Half-duplex or Auto-Negotiation modes.* Press <ENTER> again to confirm the choice.

4. Highlight the setting under the "**AgingTime**" column to adjust Address Aging for the chosen port. Address Aging is the amount of time addresses will remain in the address table before being deleted. Press <ENTER> to input a value between 0 and 43200 seconds. Press <ENTER> again to confirm the chosen value.

5. Highlight the setting under the "**SwitchingMode**" column to adjust the switching method for the chosen port. Press <ENTER> to use the arrow keys to cycle through Cut-through (CT), Store-and-forward (S&F), Adaptive cut-through (A-CT) or Fragment-free (FgFree) modes. Press <ENTER> again to confirm the choice.

6. Highlight the setting under the "**FlowControl**" column for the chosen port and press <ENTER> to use the arrow keys to toggle between enabling and disabling Flow Control for the port. Flow Control allows a port that is receiving data to signal the sender when its buffer is full, thereby ending the transmission.** Press <ENTER> again to confirm the choice.

***Note:** Auto-Negotiation will appear as a choice under the "**Duplex**" column only for 10BASE-T/100BASE-TX ports. If a 10BASE-T/100BASE-TX port is not being used, its default duplex setting will appear as **Half**. When a connection is made, the port will default to **Auto**.

****Note:** The type of flow control employed by the TigerSwitch 100 uses packet collisions as the method by which the receiving port signals the sender. Therefore, because collisions do not occur in full-duplex mode, Flow Control does not operate in ports configured in full-duplex.

In addition, when Flow Control is enabled for the 100BASE-FX ports, the allowable cable run distance is decreased from 412 m to 180 m in half-duplex mode. *(See "Connecting 100BASE-FX ports" in Chapter 3).*

Spanning Tree Configuration

The Spanning Tree Protocol (STP) is used to detect and disable network loops and to provide link back-up. It requires certain parameter settings. The factory default settings (See Figure 4-6) should be acceptable in most networks. To change the default settings, proceed as follows:

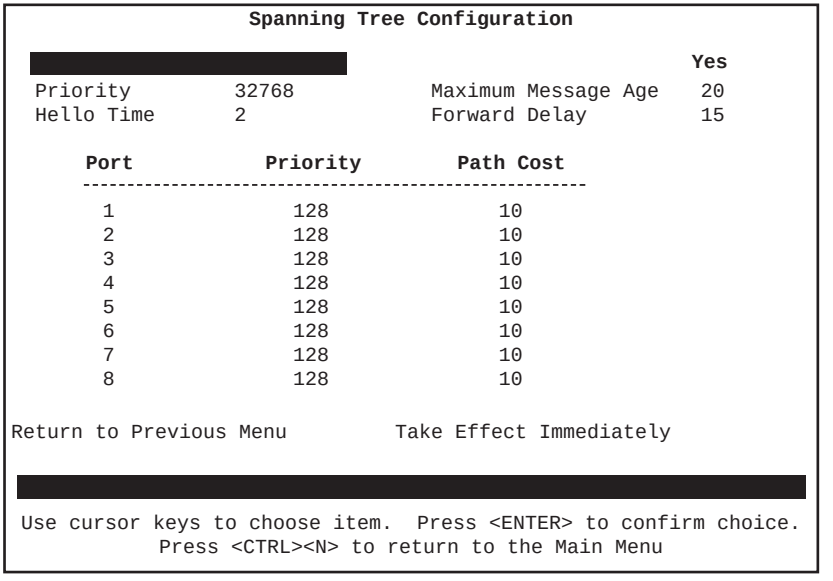

Figure 4-7. Spanning Tree Configuration Screen

1. Highlight "**Spanning Tree Configuration**" in the Main Menu and press <ENTER>. This will access the configuration screen illustrated above.

2. Highlight "**Spanning Tree Algorithm**" and press <ENTER> to use the arrow keys to toggle between enabling and disabling STP. Press <ENTER> again to confirm the choice.

3. Highlight "**Priority**" and press <ENTER> to input a priority value (0 to 65535) for the switch. Press <ENTER> again to confirm the chosen value.

4. Highlight "**Hello Time**" and press <ENTER> to input a value (1 to 10 seconds) for the rate at which hello frames are to be generated. Press <ENTER> again to confirm the chosen value.

5. Highlight "**Maximum Message Age**" and press <ENTER> to input a value (6 to 40 seconds) for the amount of time any port within the Spanning Tree network will wait before timing out its protocol information. Press <ENTER> again to confirm the chosen value.

6. Highlight "**Forward Delay**" and press <ENTER> to input a value (4 to 30 seconds) for the amount of time any port spends in the listening and learning states. Press <ENTER> again to confirm the chosen value.

7. Highlight the setting under the "**Path Cost**" column for the chosen port and press <ENTER> to input a value (0 to 65535) for the path cost of that port. This parameter is used by the STP algorithm to determine the best path between devices.* Lower values should be assigned to ports attached to faster media. Press <ENTER> again to confirm the chosen value.

8. Highlight the setting under the "**Priority**" column for the chosen port and press <ENTER> to input a value (0 to 255) for the priority of that port's use in the Spanning Tree network. If the Path Costs for all ports on a switch are the same, the port with the highest priority (i.e., lowest value) will be configured as an active link in the spanning tree. Press <ENTER> again to confirm the chosen value.

9. Highlight "**Take Effect Immediately**" and press <ENTER> to immediately enable the parameter changes. Press <ENTER> again to confirm the choice.

***Note:** Path Cost takes precedence over Port Priority

Virtual LAN Configuration

Switches do not inherently support broadcast domains. Use the Virtual LAN Configuration screen (Figure 4-7) to assign any port on the switch to up to 8 broadcast domain groups*. All ports on the switch are assigned to a single group by default.

```
                    Port Grouping Configuration

 Port  Group1  Group2  Group3  Group4  Group5  Group6  Group7  Group8
-------------------------------------------------------------------------
  1      Yes     ████     No      No      No      No      No      No
  2      Yes     No       No      No      No      No      No      No
  3      Yes     No       No      No      No      No      No      No
  4      Yes     No       No      No      No      No      No      No
  5      Yes     No       No      No      No      No      No      No
  6      Yes     No       No      No      No      No      No      No
  7      Yes     No       No      No      No      No      No      No
  8      Yes     No       No      No      No      No      No      No

  Return to Previous Menu

Use cursor keys to choose item.  Press <ENTER> to confirm choice.
            Press <CTRL><N> to return to the Main Menu
```

Figure 4-8. Virtual LAN Configuration Screen

1. Highlight "**Virtual LAN Configuration**" in the Main Menu and press <ENTER> to access the configuration screen illustrated above.

2. Highlight the setting under the appropriate group column for the chosen port. Press <ENTER> to use the arrow keys to toggle between joining the port to, or disjoining the port from, the selected group. Press <ENTER> again to confirm the choice.

3. Repeat Step 2 for each port, as needed.

***Note:** The Spanning Tree Algorithm will be automatically disabled if two or more groups are configured.

System Monitoring

The TigerSwitch 100 units can be monitored using either the front-panel Configure Button and LEDs, SNMP and Telnet or the Console Interface.

Monitoring via the Configure Button and LEDs

The Configure button may be used with the front-panel LEDs to display various system operations characteristics. To set the display mode using the Configure button:

1. Use a long press (>2 sec) to initiate display functions. The "*Status*" LED will begin blinking upon release of the button. *(See Chapter 1, "About the TigerSwitch 100," for an illustration of the front-panel LEDs)*

2. Once the "status" LED is blinking, use short presses (<2 sec) of the Configure button to cycle through the various monitoring options.

3. The function chosen will be displayed on the LED array for each port.

The chart on the following page details the functions indicated by the LEDs while in a lit (green) condition.

Status LEDs		
LEDs	**Functions**	
Power	Indicates that the switch is receiving power.	
RPU	Indicates that the optional Redundant Power Unit is supplying power to the switch.	
Status	Indicates that the LED array is displaying status information for each port (This is the default display mode).	
LED Array	Tx/Rx (60%)	Indicates that the port is transmitting or receiving data. (Blinking)
	100Mbps (30%)	Indicates that the port is set to operate at 100 Mbps. (Unlit = 10 Mbps)
	Full-Duplex (10%)	Indicates that the port is set to operate in full-duplex mode. (Unlit = half-duplex)
	Select/Link (1%)	Indicates a valid network connection.
Forward %	Indicates that the LED array is displaying the percentage of all packets forwarded by each port to another port.	
Utilization %	Indicates that the LED array is displaying the percentage of LAN bandwidth being utilized by each port.	
Collision %	Indicates that the LED array is displaying the percentage of packets in collision relative to the total number packets transmitted by each port.	
Full/Half	Indicates that the transmission mode for each port may be manually set to full- or half-duplex.	
Diagnostic	Indicates that the unit is running internal diagnostic tests.	

Advanced System Monitoring

These following display screens can be accessed through the System Configuration Program Main Menu under the Information and Statistics section. The following section headings reflect the items available in this area of the Main Menu.

System Information

This screen displays descriptive information about the switch.

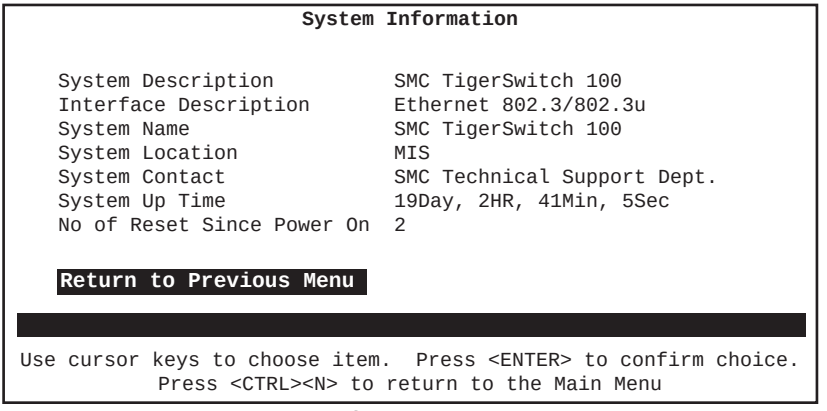

Figure 4-9. System Information Screen

System Information Screen Items

Parameter	Description
System Description	System's model and name
Interface Description	ANSI/IEEE standards compliance
System Name	Name assigned to the switch
System Location	Specifies the location where switch resides
System Contact	Contact person responsible for the system
System Up Time	Length of time the switch management agent has been running
No of Reset Since Power On	Number of times the switch has been reset or the address table cleared

Port Status

This screen displays the current status of each port on the switch.

```
                              Port Status

  Port  MediaType Enabled Link Speed Duplex AgTime SwhMode
FlowCntl----------------------------------------------------------------------

   1       TX      Yes     Up    10M    Half    300    A-CT      Yes
   2       TX      Yes     Down  ---    ---     ---    ---       ---
   3       TX      Yes     Up    10M    Full    300     CT       No
   4       TX      Yes     Up    100M   Half    300    A-CT      Yes
   5       FX      Yes     Up    100M   Half    300    A-CT      Yes
   6       FX      Yes     Up    100M   Full    300     CT       No
   7       TX      Yes     Up    100M   Half    300   FgFree     Yes
                                  8      TX     Yes     Up       10M
                              Half300    S&F     Yes
```

Figure 4-10. Port Status Screen

Port Status Screen Items

Parameter	Description
Media Type	Displays Port type (100BASE-FX, etc.)
Enabled	Shows whether the port is enabled
Link	Indicates whether a device is attached to the port and is transmitting a link pulse signal
Speed	Indicates at what speed port is operating
Duplex	Indicates whether the port is running in full- or half-duplex mode
AgTime	Time (in sec.) after which unused addresses will be discarded from address table
SwhMode	Shows the method chosen for data packet forwarding (i.e., cut-through, fragment-free, etc.)
FlowCntl	Shows whether Flow Control is enabled

Statistics

This screen displays statistical information for any port or the entire switch, depending on the display mode chosen. (See **Item 1** below)

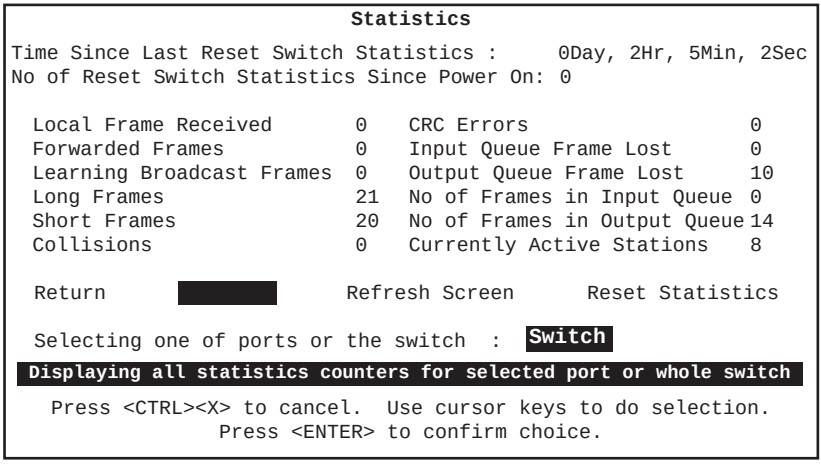

Figure 4-11. Statistics Screen

This screen provides the following options:

1. Highlight "**Display**" and press <ENTER> to select statistical display. Use arrow keys to cycle through display selections (Ports 1-8 or the whole switch). Press <ENTER> to confirm the choice.

2. Highlight "**Refresh Screen**" and press <ENTER> to update all statistics counters.

3. Highlight "**Reset Statistics**" and press <ENTER> to clear all statistics counters.

See the chart on the following page for a description of the statistics displayed on this screen.

Statistics Screen Items

Item	Description
Time Since Last Reset of Statistics	Number of times this port (or whole switch) or address table has been reset since power on
Local Frames Received	Number of frames confined to this segment and not forwarded
Forwarded Frames	Number of frames forwarded to another segment
Learning Broadcast Frames	Number of learning broadcast frames received on this port
Long Frames	Number of times frame length has exceed maximum allowable size (i.e., 1,518 bytes)
Short Frames	Number of frames less than 64 bytes long
Collisions	Number of simultaneous node transmissions detected
CRC Errors	Number of Cyclic Redundancy Check errors
Input Queue Frame Lost	Number of frames lost because input queue is full
Output Queue Frame Lost	Number of frames lost because output queue is full
No of Frames in Input Queue	Number of frames currently in input queue
No of Frames in Output Queue	Number of frames currently in output queue
Currently Active Stations	Number of entries in the address table, regardless of segment

Address Table

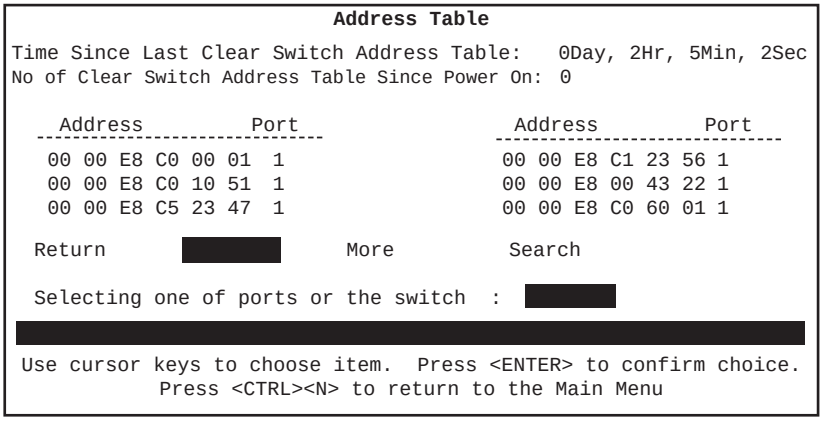

Figure 4-12. Address Table Screen

This screen provides the following options:

1. Highlight "**Display**" and press <ENTER> to select address table display. Use arrow keys to cycle through display selections (Ports 1-8 or the whole switch). Press <ENTER> to confirm the choice.

2. Highlight "**More**" and press <ENTER> to view more pages of address table entries.

3. Highlight "**Search**" and press <ENTER> to input a particular MAC address to search for in the address table of a selected port or the whole switch. Press <ENTER> to start search.

Spanning Tree Information

The screen illustrated in Figure 4-12 shows a summary of the Spanning Tree configuration. This screen is only accessible if the Spanning Tree Protocol is enabled *(See the section entitled, "Spanning Tree Configuration" in this chapter)*.

```
                  Current Spanning Tree Information

Hello Time  : 2                      Max Message Age  : 20
Forward Delay  : 15                  Root  : 32768.00800F000001
Root Port  : No_Port                 Root Cost  : 0
Topology Change Count  : 0
Time Since Last Topology Change  : 0Day, 2Hr, 19Min, 41Sec

Port   State      DesignatedCost  DesignatedBridgeID  DesignatedPort
-------------------------------------------------------------------------------
 1     Disabled       128          32769.0000E8C02004      128.1
 2     Blocking       128          32770.0000E8C02008      128.1
 3     Listening      128          32771.0000E8C02010      128.1
 4     Learning       128          32772.0000E8C02018      128.1
 5     Forwarding     128          32773.0000E8C02020      128.1
 6     Learning       128          32774.0000E8C02028      128.1
 7     Blocking       128          32775.0000E8C02038      128.1
 8     Disabled       128          32776.0000E8C02040      128.1

 Return to Previous Menu

 Use cursor keys to choose item.  Press <ENTER> to confirm choice.
            Press <CTRL><N> to return to the Main Menu
```

Figure 4-13. Spanning Tree Information Screen

Spanning Tree Information Screen Items

Parameter	Description
Hello Time	Displays the rate (in seconds) at which hello frames are generated.
Forward Delay	The amount of time (in seconds) any port in the Spanning Tree will wait before changing states (i.e., listening to learning, etc.).
Root Port	The port on the switch that communicates with the root device of the Spanning Tree. If the switch is the root device, then "No_Port" will appear in this field.
Topology Change Count	The number of times a port has entered the forwarding state plus the number of times a port has changed from forwarding to blocking.
Time Since Last Topolgy Change	The time since a port has entered the forwarding state or changed from forwarding to blocking.
Max Message Age	The maximum time (in seconds) a device in the Spanning Tree can wait for a message before reconfiguring.
Root	MAC address of the root device in the Spanning Tree.
Root Cost	The path cost from the switch's root port to the root device.
State	The current state of the port within the Spanning Tree: **Disabled** - Port has been disabled or failed diagnostics. **Blocked** - Port receives STP configuration messages, but does not forward packets. **Listening** - Port leaves Blocking state, transmits configuration messages, but does not yet forward packets. **Learning** - Port has transmitted configuration messages, address table cleared, port begins learning addresses. **Forwarding** - Port forwards packets and learns addresses.
Designated Cost	The cost for a packet to go from this port to the root. The slower the media, the higher the cost.
Designated Bridge ID	The priority and MAC address of the device through which this port must communicate to reach the root.
Designated Port	The port on the designated bridge through which the switch must communicate to reach the root.

Downloading System Software

System software updates can be downloaded either in-band via TFTP Protocol or out-of-band through the console port. Downloading software via TFTP is substantially faster than serial downloading through the console port. After either type of file transfer, the switch will automatically restart.

Downloading via TFTP Protocol

In order to use this method, there must be an available TFTP server which is IP accessible from the switch.

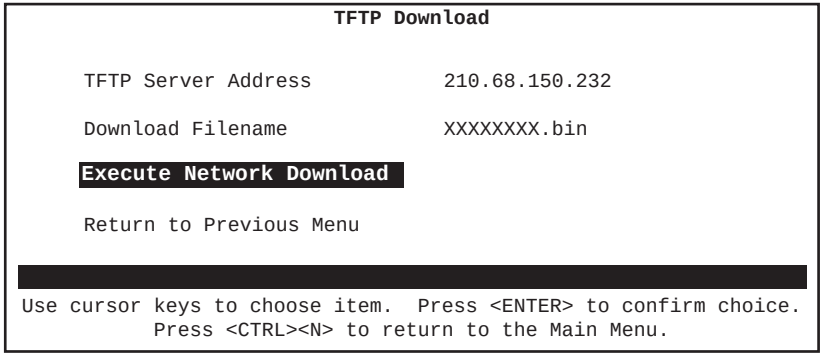

Figure 4-14. TFTP Download Screen

1. Highlight "**TFTP Download**" in the Main Menu and press <ENTER>. This will access the TFTP Download Screen.
2. Highlight "**TFTP Server Address**" and press <ENTER> to input an IP address for the TFTP server. Press <ENTER> to confirm entry.
3. Highlight "**Download Filename**" and press <ENTER> to input the file to be downloaded, if required. The file should be a *.bin file from SMC. Press <ENTER> to confirm entry.

4. Highlight "**Execute Network Download**" and press <ENTER>. The system will ask for confirmation. Press <ENTER> to initiate download after confirmation.

Downloading via the Console Port

Software update files can be downloaded through the Console port using any terminal emulation program that can transmit binary files using Xmodem communications protocol. The ASCII transfer parameters should be set for maximum throughput.

1. Highlight "**Serial Download**" in the Main Menu and press <ENTER>. This command specifies a direct upload from an attached device via the Console port.
2. Specify Xmodem protocol and the download filename using the terminal emulation program.
3. Initiate the download from the terminal emulation program.

Resetting the Switch

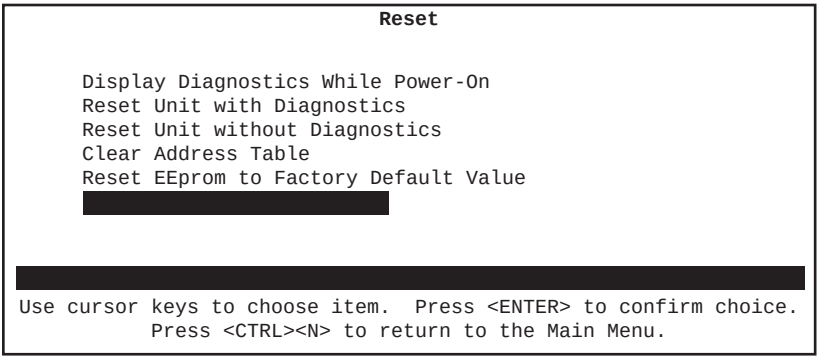

Figure 4-15. Reset Screen

This screen provides the following options:

1. Highlight "**Reset**" in the Main Menu and press <ENTER> to access the reset screen (Figure 4-14).

2. Highlight "**Display Diagnostics While Power-On**" and press <ENTER> to enable/disable diagnostic indicators during a reset.

3. Highlight "**Reset Unit with Diagnostics**" or "**Reset Unit without Diagnostics**" and press <ENTER> to enable or disable diagnostic tests, respectively, during a reset.

4. Highlight "**Clear Address Table**" and press <ENTER> to clear the address table of a single port or the whole switch. Use arrow keys to cycle through selections (Ports 1-8 or the whole switch). Press <ENTER> to confirm the choice.

5. Highlight "**Reset EEprom to Factory Default Value**" and press <ENTER> to clear all counters and restore factory default settings for all configuration parameters. The system will ask for confirmation. Press <ENTER> to confirm and initiate.

CHAPTER 5
MANAGEMENT VIA SNMP

SNMP Protocol 5-2
MIB Objects 5-3
SNMP Parameter Configuration 5-4
Assigning SNMP Agent Access Rights 5-4

SNMP Protocol

SNMP (Simple Network Management Protocol) is a communication protocol designed specifically for the purpose of managing devices or other elements on a network. Network equipment commonly managed with SNMP includes hubs, switches, bridges, routers and host computers. SNMP is typically used to configure these devices for proper operation in a network environment, as well as monitor them to evaluate performance and detect potential problems.

Managed entities supporting SNMP typically contain software which runs locally on the device and is referred to as an **agent**. The agent monitors and allows control of the functionality of the device. A defined set of variables, referred to as objects, is maintained by the agent and used to manage the device. These objects are defined in a **Management Information Base (MIB)** which allows for a standard presentation of information controlled by the agent over the network.

The software used to access the information maintained by the SNMP agent is referred to as the manager. This software typically runs on a network-attached station and can manage a number of agents at once. The management software uses an MIB specification, equivalent to that which the agent maintains, to read and write objects controlled by the agent for purposes of configuring and monitoring the device. SNMP defines the format of the MIB specifications and the protocol used to access this information.

There are three main operations defined in SNMP. Operations which read information from the managed device, such as may be used to obtain status or statistical data, are called **GET operations**. Operations that change a functional parameter on the device, such as may be used to configure security access to the device or to initiate a self test, are referred to as **SET operations**. GET and SET operations are initiated only by

the manager software, and result in a response by the agent. The third operation type, the **TRAP**, allows the agent to send an unsolicited message to the manager. This operation is typically used as an alert to a potential problem, or a change in device status.

MIB Objects

A number of different MIB specifications have been defined for managing network equipment; some are standard, others are proprietary. SNMP-compliant devices typically support one or more standard MIBs defined by the IETF, in the form of Request for Comments (RFC) documents. These allow for a common method of managing devices, such as bridges and hubs, and network interfaces, such as Ethernet and Token Ring.

The main standard MIB, referred to as MIB II, provides an overall view of the managed agent and is supported, at least in part, by all SNMP agents. In addition, proprietary MIB extensions are defined by commercial vendors for managing device-specific functions of their products.

The standards supported by the TigerSwitch 100 units include:

- RFC 1493 - Definitions of Managed Objects for Bridges
- RFC 1213 - Simple Network Management Protocol

SNMP Parameter Configuration

In order to access the SNMP agent resident in the TigerSwitch 100 units, the switch must be configured with a valid IP address, default gateway and subnet mask. This is accomplished through the System Configuration Program, which can be accessed in-band or out-of-band *(See Chapter 4, "Configuration and Management")*. Additional SNMP operating parameters may also be configured through this program.

Assigning SNMP Agent Access Rights

1. Highlight "**SNMP Configuration**" in the System Configuration Program Main Menu (See Chapter 4) and press <ENTER>. This will access the SNMP Configuration screen (See below).

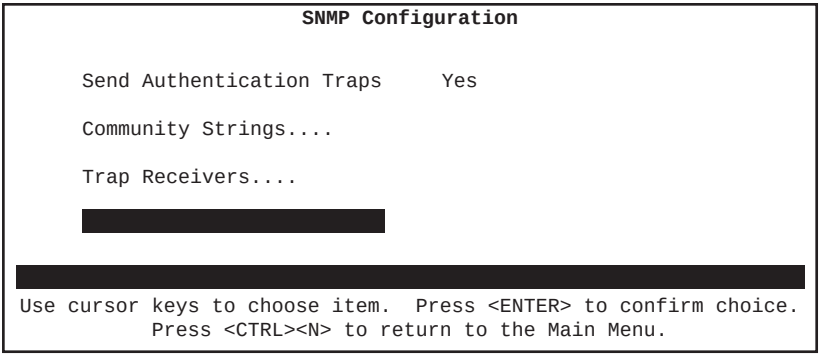

Figure 5-1. SNMP Configuration Screen

2. Highlight "**Send Authentication Traps**" and press <ENTER> to enable the SNMP agent to issue a trap message to specified stations (Trap Receivers) in the event that it receives a request containing an invalid community string. To define valid community strings, proceed with Step 3. Otherwise, skip to Step 5.

3. Highlight "**Community Strings**" and press <ENTER>. This will access the Community Strings screen (Figure 5-2).

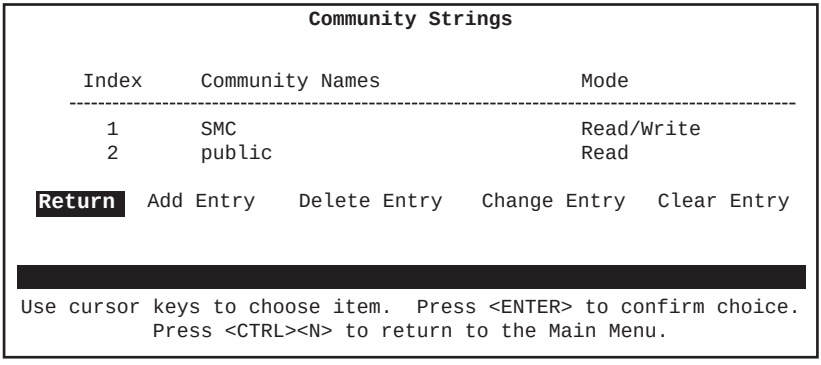

Figure 5-2. Community Strings Screen

4. Highlight "**Add Entry**" and press <ENTER> to input a community name and its access mode.* The community name is the community string required for trap management access. The access mode determines the rights available to trap receiver stations assigned with that community string.

***Note:** The community name must match the SNMP package, as well as the switch.

5. Highlight "**Trap Receivers**" in the SNMP Configuration screen (Figure 5-1) and press <ENTER> to access the Trap Receivers screen (Figure 5-3).

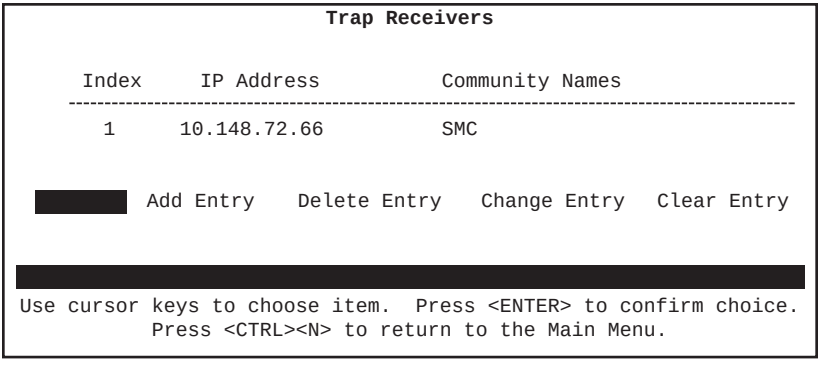

Figure 5-3. Trap Receivers Screen

6. Highlight "**Add Entry**" and press <ENTER> to input an IP Address for a receiver station and assign a community name and index for that station. Repeat this step for each receiver station required (up to 8).

APPENDIX A
TROUBLESHOOTING

Switch Indicators A-2

Diagnostic Tests A-3

- System Diagnostic Tests A-3
- Port Diagnostic Tests A-4

System Diagnostics A-4

- Power and Cooling Problems A-4
- Installation A-4
- Communication Mode A-5
- Cabling A-5
- Network Cards A-5
- Physical Configuration A-5
- Management Interface A-6
  - Terminal Emulation A-6
  - Telnet A-6
- System Integrity A-7

Switch Indicators

The LED indicators on TigerSwitch 100 can be of assistance in identifying problems. Some common problems and possible solutions are described below.

Symptom: Link LED does not light up (green) after making a connection.

Cause: Network interface (e.g., network card on the attached device), network cable or switch port may be defective, 4-port module *(Model SMC6608M)* is not properly seated.

Solution: Verify that the switch and attached device are powered on. Be sure the cable is plugged into both the switch and corresponding device. Verify that the proper cable type is used and its length does not exceed specified limits (100 m or 328 ft.). Check the network card and cable connections for possible defects. Replace the defective card or cable, if necessary. If applicable, verify that the 4-port module is properly seated. Re-install the module, if necessary.

Symptom: Power LED does not light up (green) after power on.

Cause: Defective power outlet, power cord or internal power supply.

Solution: Check the power outlet by plugging in another device that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, contact SMC Technical Support for assistance.

Diagnostic Tests

Upon power-up, the TigerSwitch 100 units perform self-diagnostic tests (See Chapter 3). Diagnostic tests similar to those performed on power-up can be run using the Configure button:

1. Use a long press (>2 seconds) to begin function selection. The *Status* LED will start to flash to indicate that functions may be selected. Use short presses (<2 seconds) to cycle through the status LEDs until the *Diagnostic* LED lights. Use a long press to initiate diagnostic tests.

System Diagnostic Tests

The diagnostic test sequence is performed in two stages. The first stage is the system diagnostic test. The following table details system level failures, which are indicated in the *Select/Link* row of the LED array:

System Failures

Component Failure	LED Array Indicator Column
System ROM	1
System RAM	2
System EEPROM	3

Port Diagnostic Tests

Port Diagnostic Tests, the second diagnostic test phase, check each port. The following table details port failures, which are indicated in the column of the LED array corresponding to the malfunctioning port:

Port Failures

Test Failure	LED Array Row
Output Queue RAM Test	Tx/Rx
Input Queue RAM Test	100Mbps
Routing Table Test	Full-Duplex
Port IC Test	Select/Link

System Diagnostics

Power and Cooling Problems

If the Power LED does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord or internal power supply as explained in the previous section. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fan on back of the unit is unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact SMC Technical Support for assistance.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g., the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Communication Mode

The communication mode of each port (half or full duplex and 10 Mbps or 100 Mbps) must be identical to the mode of the attached device. Verify that each port is set to the same communication modes used by the attached device. Each 100BASE-FX port must be configured for half- or full-duplex operation. For each 10BASE-T/100BASE-TX port, the communication mode is configured automatically via Auto-Negotiation. However, if the attached device does not support Auto-Negotiation, then you must configure the port manually.

(See Chapter 4, "Configuration and Management", for port configuration instructions.)

Cabling

Verify that the cabling type is correct. Be sure all cable connectors are securely seated in the required ports. Also check to be sure you are using the proper cable type: straight-through or crossover. Use Category 5 twisted-pair cable for 100BASE-TX connections and Category 3, 4 or 5 cable for 10BASE-T connections. Use 62.5/125 micron core multimode fiber cable for 100BASE-FX connections.

Make sure all devices are connected to the network. Equipment may have been disconnected unintentionally.

Network Cards

Make sure the network interface hardware and software drivers for the attached devices are functioning properly. Check the network cards and associated drivers used in any attached workstation or server.

Physical Configuration

If problems occur after altering the network configuration, restore the original connections, and try to track the problems

down by implementing the new changes, one step at a time. Ensure that cable distances and other physical aspects of the installation comply with recommendations. *(See "Making Network Connections" in Chapter 3.)*

Management Interface

Terminal Emulation

If the terminal attached to the console port is not operating properly, check that:

1. the attached terminal or terminal emulator is set to VT100
2. you are using the correct cable type *(See Chapter 4, "Configuration and Management")* and that it is properly connected.
3. the console is configured properly (8 data bits, 1 stop bit, no parity and 9600 or 19200 bps).
4. if you are using terminal emulation, there are no IRQ conflicts.(i.e., Make sure device drivers are not using the same IRQ required to run the COM port).

Telnet

If you have trouble establishing a link to the System Configuration Program using Telnet:

1. Check to make sure the network connection is valid.
2. Verify that the correct IP address for the switch has been entered at the Telnet location.
3. Make sure the port on the switch through which you are trying to establish a Telnet connection is enabled. *(See Chapter 4, "Configuration and Management")*
4. Check the cabling between the Telnet site and the switch.

System Integrity

As a last resort, verify the integrity of the switch with a power-on reset (See Chapter 4, “Configuration and Management”). If the problem still persists and you have completed all the preceding diagnoses, contact SMC Technical Support for further assistance. Be sure to check the Login Screen (Figure 4-1.) for the version of the System Configuration Program (Chapter 4) installed on your TigerSwitch 100. Keep this information close at hand when you contact SMC Technical Support.

APPENDIX B
PIN ASSIGNMENTS

RJ-45 Pin Assignments B-2
Straight-through Wiring B-3
Crossover Wiring B-3
Console Port Pin Assignments B-4

RJ-45 Pin Assignments

Caution: Regulations regarding the connection of equipment to telephone networks vary from country to country. Check with your local telephone network supplier before using existing telephone wiring.

An Ethernet twisted-pair link segment requires two pairs of wires—Category 3, 4 or 5 for 10 Mbps connections and Category 5 for 100 Mbps connections. Each wire pair is identified by two different colors. For example, one wire might be brown and the other, brown with white stripes.

Caution: Each wire pair must be attached to the RJ-45 connectors in a specific orientation. (See "Twisted-Pair Cabling Guidelines" in Chapter 3 for an explanation.)

Each twisted-pair link segment must have an RJ-45 connector attached to both ends. According to the IEEE specifications, pins 1 and 2 are used for transmitting data, and pins 3 and 6 for receiving data.

RJ-45 Pin Assignments	
Pin Number	**Assignment***
1	Tx+
2	Tx-
3	Rx+
6	Rx-

*The "+" and "-" signs are used to represent the polarity of the wires that make up each wire pair.

Note how the pins are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

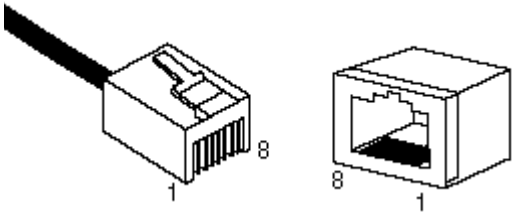

Figure B-1. RJ-45 Connector Pin Numbers

Straight-Through Wiring

If the twisted-pair link segment is to join two ports and only one of the ports has an internal crossover, the two pairs of wires must be straight-through.

Straight-Through RJ-45 Pin Assignments	
End 1	**End 2**
1 (Tx+)	1 (Tx+)
2 (Tx-)	2 (Tx-)
3 (Rx+)	3 (Rx+)
6 (Rx-)	6 (Rx-)

Crossover Wiring

If the twisted-pair link segment is to join two ports and either both ports are labeled with an “x” or neither port is labeled with an “x,” a crossover must be implemented in the wiring.

Crossover RJ-45 Pin Assignments	
End 1	**End 2**
1 (Tx+)	3 (Rx+)
2 (Tx-)	6 (Rx-)
3 (Rx+)	1 (Tx+)
6 (Rx-)	2 (Tx-)

Console Port Pin Assignments

The DB-9 serial console port on the front-panel is used to connect the switch to a console device, either directly or remotely. The pin assignments for connection to another DB-9 port or a DB-25 port are provided below and on the following pages.

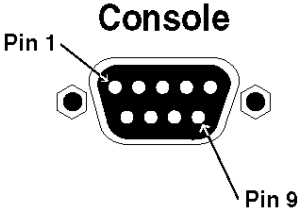

Figure B-2. DB-9 Console Port Pin Numbers

Note: Any cable connected to the Console port must be shielded to comply with FCC emissions regulations and with requirements of other regulatory agencies in various parts of the world.

DB-9 Pin Assignments		
Signal	**DB-9* Pin No. DTE**	**DB-25 Pin No. DCE**
DCD (Data Carrier Detected)	1	8
RxD (Received Data)	2	3
TxD (Transmitted Data)	3	2
DTR (Data Terminal Ready)	4	20
SG (Signal Ground)	5	7
DSR (Data Set Ready)	6	6
RTS (Request to Send)	7	4
CTS (Clear to Send)	8	5
RI (Ring Indicator)	9	22

* DB-9 port on PC or TigerSwitch 100.

Console Port to 9-Pin COM Port on PC

Switch Port DB-9 Pin No.	Signal	PC Port DB-9 Pin No.
1 (DCD)	DCD	1
2 (RXD)	TXD	3
3 (TXD)	RXD	2
4 (DTR)	DSR	6
5 (SGND)	SGND	5
6 (DSR)	DTR	4
7 (RTS)	CTS	8
8 (CTS)	RTS	7
9 (RI)	RI	9

Console Port to 25-Pin DCE Port on Modem

Switch Port DB-9 Pin No.	Signal	25-Pin Modem Port DCE Pin No.
1	DCD	8
2	RXD	3
3	TXD	2
4	DTR	20
5	SGND	7
6	DSR	6
7	RTS	4
8	CTS	5
9	RI	22

Console Port to 25-Pin DTE Port on PC

Switch Port DB-9 Pin No.	Null Modem	25-Pin PC Port DTE Pin No.
1 (DCD)	1 — 1	8 (DCD)
2 (RXD)	2 — 3	3 (TXD)
3 (TXD)	3 — 2	2 (RXD)
4 (DTR)	4 — 8	20 (DTR)
5 (SGND)	5 — 20	7 (SGND)
6 (DSR)	6 — 7	6 (DSR)
7 (RTS)	7 — 4	4 (RTS)
8 (CTS)	9 — 5	5 (CTS)
9 (RI)	20 — 6	22 (RI)

APPENDIX C
SPECIFICATIONS

All Models C-2
Model SMC6608T C-4
Model SMC6608M C-4
Fast Ethernet Modules C-4

All Models

Switching Methods
Adaptive Cut-through
Cut-through
Store-and-forward
Fragment-Free

Memory Buffer
256K per port

Filtering/Forwarding/Learning Rates
Full line rate

MAC Address Table
4,096 entries

Latency
<20 µsec

VLAN Support
Port-based grouping, up to 8 groups with port overlapping

Flow Control
Back pressure mechanism (limits fiber cable distance to 180 m in half-duplex mode)

In-Band Management
Telnet or SNMP manager

Out-of-Band Management
RS-232 Console port

Software Loading
TFTP in-band or RS-232 serial out-of-band

Full Duplex
All ports via software or manual selection

Status LEDs
Power
RPU
Status
Forward%
Utilization%
Collision%

Full/Half
Diagnostic

LED Array
Tx/Rx (60%)
100Mbps (30%)
Full-Duplex (10%)
Select/Link (1%)

Button
Configure

Size
17.25 in. x 13.75 in. x 1.75 in.
(43.8 cm x 34.9 cm x 4.4 cm)

Input Power
Universal AC input
100 to 240 VAC, 50 to 60 Hz

Power Consumption
80 watts max @ 100-240 VAC

Operating Temperature
0° C to 40° C (32° F to 104° F)

Humidity
10% to 90% (non-condensing)

Ethernet Standards
ANSI/IEEE 802.3 and ISO/IEC 8802-3 Ethernet
ANSI/IEEE 802.3u Fast Ethernet

EMC/Safety Compliances
CE marking
UL 1950
CSA 22.2 No. 950
EN60950 (TÜV/GS)
FCC Class A
Industry Canada Class A
AS/NZS 3548 (1995) - Class A
VCCI Class A
EN55022 (CISPR 22) Class A
IEC 1000-4-2/3/4/6

Model SMC6608T

Ports
8 10BASE-T/100BASE-TX, Auto-Negotiation support

Network Interface
10BASE-T
RJ-45 connector, 100 Ohm, UTP cable; 2 wire pair; EIA/TIA Categories 3, 4, 5
100BASE-TX
RJ-45 connector, 100 Ohm, UTP cable; 2 wire pair; EIA/TIA Category 5

Weight
8.2 lbs. (3.7 kg)

Model SMC6608M

Weight (without modules)
7.8 lbs. (3.5 kg)

Fast Ethernet Modules
SMC6600T
Ports 1-3: Twisted Pair, RJ-45 connector, fixed crossover
Port 4: Twisted Pair, RJ-45 connector, switch-selectable crossover

SMC6600F
Ports 1-4: Fiber, SC connector

SMC6600FSCT
Ports 1-2: Fiber, SC connector
Port 3: Twisted Pair, RJ-45 connector, fixed crossover
Port 4: Twisted Pair, RJ-45 connector, switch-selectable crossover

SMC6600FSTT
Ports 1-2: Fiber, ST connector
Port 3: Twisted Pair, RJ-45 connector, fixed crossover
Port 4: Twisted Pair, RJ-45 connector, switch-selectable crossover

Network Interface

10BASE-T

RJ-45 connector, 100 Ohm, UTP cable; 2 wire pair; EIA/TIA Categories 3, 4, 5

100BASE-TX

RJ-45 connector, 100 Ohm, UTP cable; 2 wire pair; EIA/TIA Category 5

100BASE-FX

SC or ST connector, multimode fiber cable, 50/125 or 62.5/125 μ core

APPENDIX D
GLOSSARY

Glossary D-2

10BASE-T

IEEE specification for 10 Mbps Ethernet on two pairs of Category 3, 4 or 5 twisted-pair cable. The point-to-point cable segment can be up to 100 m (328 ft.) in length.

100BASE-FX

IEEE specifications for 100 Mbps Fast Ethernet on multimode fiber optic cable. The maximum length for a point-to-point connection is 2 km (1.24 mi.) in full-duplex mode, or 412 m (0.25 mi.) in half-duplex mode.

100BASE-TX

IEEE specifications for 100 Mbps Fast Ethernet on two pairs of Category 5 twisted-pair cable. The point-to-point cable segment can be up to 100 m (328 ft.) in length.

ANSI/IEEE 802.3 Standard

Standard developed by the ANSI/IEEE (American National Standards Institute/Institute of Electrical and Electronics Engineers) for the physical and electrical connections in Ethernet local area networks.

ANSI/IEEE 802.3u Standard

Standard developed by the ANSI/IEEE (American National Standards Institute/Institute of Electrical and Electronics Engineers) for the physical and electrical connections in Fast Ethernet local area networks.

BOOTP

Boot protocol used to load the operating system for devices connected to the network.

Collision

A condition in which packets transmitted over the cable interfere with each other. Their interference makes both signals unintelligible.

Crossover Port

An RJ-45 port which crosses the receive and transmit signals internally so it can be connected with straight-through twisted-pair cable to a workstation, server or any other device having a straight-through port.

CSMA/CD

CSMA/CD (Carrier Sense Multiple Access/Collision Detect) is the communication method employed by Ethernet and Fast Ethernet.

End Station

A workstation, server, switch, bridge or router.

Ethernet

A network communication system developed and standardized by DEC, Intel, and Xerox, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable. The successor IEEE 802.3 standard provides for integration into the OSI model and extends the physical layer and media with repeaters and implementations that operate on fiber, thin coax and twisted-pair cable.

Fast Ethernet

A 100 Mbps network communication system based on Ethernet and the CSMA/CD access method.

ICMP (Internet Control Message Protocol)

Commonly used to send echo messages (i.e., Ping) for monitoring purposes.

In-Band

A way of communicating with a network device from inside the network (i.e., a local connection).

LED

Light emitting diode used for monitoring a device or network condition.

Local Area Network

A group of interconnected computers and support devices.

Media Access Control (MAC)

A portion of the networking protocol that governs access to the transmission medium, facilitating the exchange of data between network nodes.

MIB

An acronym for Management Information Base. It is a set of database objects that contains information about the device.

Network Diameter

Wire distance between two end stations in the same collision domain.

Out-of-Band

A way of communicating with a network device from outside the network.

RJ-45 Connector

A connector for twisted-pair wiring.

Terminator

A resistor placed at each end of a thick or thin coax cable to make sure that signals do not reflect back and cause errors.

Simple Network Management Protocol (SNMP)

The application protocol offering network management services in the Internet suite of protocols.

Straight-through Port

An RJ-45 port which does not cross the receive and transmit signals internally so it can be connected with straight-through twisted-pair cable to any device having a crossover port. Also referred to as a "Daisy-Chain" port.

UTP (Unshielded Twisted-Pair)

Cable composed of two insulated wires twisted together to reduce electrical interference; used in common telephone cord.

Xmodem

A protocol used to transfer files between devices. Data is grouped in 128-byte blocks and error-corrected.

FOR TECHNICAL SUPPORT, CALL:

From U.S.A. and Canada (8:30 AM - 8:00 PM Eastern Time)
(800) SMC-4-YOU; (516) 435-6250; (516) 434-9314 (Fax)

From Europe (8:00 AM - 5:30 PM UK Greenwich Mean Time)
44 (0) 1344 420068; 44 (0) 1344 418835 (Fax)

Bulletin Board Services (BBS)

Modem settings: 9600,8,n,1
New York: (516) 434-3162 (connect speed up to 14,400)
Southern Europe: 33 (1) 39.73.57.00
United Kingdom: 44 (0) 1344 418838

e-mail addresses for driver updates

techsupport@smc.com european.techsupport@smc.com

SMC Forum on Compuserve

At the prompt (!) type: GO SMC

INTERNET

World Wide Web: http://www.smc.com/
FTP Site: ftp.smc.com

FOR LITERATURE OR ADVERTISING RESPONSE CALL:

U.S.A. and Canada:	(800) SMC-4-YOU;	Fax (516) 273-1803
New York:	(516) 435-6000;	Fax (516) 273-1803
Latin America:	(630) 916-7007;	Fax (630) 916-6304
Southern Europe:	33 (1) 30.87.42.42;	Fax 33 (1) 30.61.41.34
Europe:	44 (0) 1344 418800;	Fax 44 (0) 1344 418828
Northern Europe:	44 (0) 1344 418820;	Fax 44 (0) 1344 418826
Central Europe:	49 (0) 89 92861-0;	Fax 49 (0) 89 92861-230
Eastern Europe/Middle East:	49 (0) 89 92861-142;	Fax 49 (0) 89 9101934
South Africa:	27 (0) 11 784-0414;	Fax 27 (0) 11 784-0363
Asia Pacific:	(65) 336 1800;	Fax (65) 339 6625
South Asia:	(65) 336 1800;	Fax (65) 336 3955
South Korea:	82-2-551-2751;	Fax 82-2635-7730
Japan:	81 (3) 57212271;	Fax 81 (3) 57212270
Australia (Sydney):	61-2-9929-9150;	Fax 61-2-9929-9140
Australia (Melbourne):	61-3-9653-9461;	Fax 61-3-9653-9548

EliteFax (SMC's Fax-on-Demand System):
U.S.A. and Canada: (800) SMC-8329
Elsewhere: (516) 435-6107

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